

**City of Issaquah
Hazard Mitigation Plan
and
Addendum to the King County Regional
Hazard Mitigation Plan

With

Hazard Identification and
Vulnerability Assessment**

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OVERVIEW

This update to the City of Issaquah's 2004 addendum to the King County Multi-Jurisdiction (Regional) Hazard Mitigation Plan (RHMP) was developed as a stand-alone document as well as an addendum to the RHMP. The decision to develop a stand-alone Hazard Mitigation Plan (HMP) became necessary due to timing issues with the RHMP planning process, which was interrupted by Howard Hansen Dam emergency flood preparations. Except for updated mitigation strategies and community profile this is a new document.

The City of Issaquah has developed this Plan update in an effort to increase the community's response to hazardous conditions. The addendum focuses on the hazards that could affect the City of Issaquah, Washington, which include: earthquake/seiche, flooding, severe weather/windstorm, volcano, wildfire, mine collapse, epidemic, hazardous spills, pipeline eruption, power failure, terrorism, cyber-terrorism, transportation emergency and urban fire. It is impossible to predict exactly when disasters may occur or the extent to which they will affect the city. However, with careful planning and collaboration among public agencies, private sector organizations and citizens within the community, it is possible to minimize the losses that can result from hazardous conditions.

This plan provides a set of actions and identifies existing mechanisms to reduce the risks posed by hazards through education and outreach programs, structural improvements and the implementation of preventative activities such as land use or watershed management programs. The actions described in the addendum are intended to be implemented through existing plans and programs within the city.

The addendum is comprised of the following sections: 1) Development Process 2) Community Profile; 3) Hazard Identification Vulnerability Assessment; 4) Mission, Goals and Action Items; and 5) Plan Implementation and Maintenance.

DEVELOPMENT PROCESS

The City of Issaquah participated in King County 2009 planning process and developed this addendum to the county's plan during this planning process. This is an update to the City of Issaquah's existing Hazard Mitigation Plan. Representatives of the City's Emergency Management Planning Group (EMPG) representing departments citywide (see table below) reviewed the Hazard Mitigation Plan for previously identified and potential new threats and hazards to the City.

Department	Position	Name
Mayor's Office	Deputy Administrator	Joe Meneghini
Mayor's Office	Public Information Officer	Autumn Monahan
Emergency Management	Director	Bret Heath
Emergency Management	Coordinator	Steve Campbell
Public Works Operations	Director	Bret Heath
Public Works Engineering	Deputy Director	Sheldon Lynne
Police	Commander	Stan Conrad
Finance	Risk Management Officer	Mary Lorna Meade
Building	Plans Examiner	Lon Keirse
Building	Building Inspector	Shay Weer

Department	Position	Name
Information Technology	Information Systems Manager	Chris Givens
Parks and Recreation	Building Maintenance Supervisor	Ric Patterson
Human Resources	Director	Ruben Nieto
Planning	Senior Planner	Mark Pywell
Eastside Fire and Rescue	Captain	Steve Westlake

The City also reviewed its existing programs to identify gaps that may lead to disaster vulnerabilities and worked on ways to address these risks through mitigation. The Emergency Management Planning Group worked on developing mitigation strategies appropriate for the City. The City placed the Hazard Mitigation Plan with strategies prioritized by City staff on its website, providing opportunity for the public, businesses, other governmental agencies and private and non-profit interests to comment. The City hosted a Public meeting on the Hazard Mitigation Plan on August 17, 2009; no comments were received during the public comment period or at the public meeting. During plan development and again prior to plan adoption the update appeared on the official agenda for the City Council which is posted on the City's web site, and sent to local and regional newspapers, radio stations, local businesses and private individuals via e-mail. This agenda distribution provides additional notification and opportunity for community review and comment. City emergency management staff also took part in several public meetings held by King County to discuss issues surrounding mitigation activities in general, but also as they specifically relate to the Howard Hansen Dam issue and the subsequent impact on the City and surrounding communities.

In addition to the City of Issaquah review of its own plans and programs, the City also took part in the overall planning process involved in developing the King County Multi-Jurisdiction Hazard Mitigation Plan. Representatives from many jurisdictions throughout King County served in this planning process.

The planning process was designed to: (1) result in a plan that is Disaster Mitigation Act 2000 compliant; (2) coordinate with the State's and County's plan and activities and (3) Identify mitigation strategies that will result in a more disaster resistant community. The following is a summary of major activities included in the planning process.

Phase 1: Getting Started

One of the first tasks accomplished by the planning team was to identify members to serve on the over-all base plan's steering committee. City of Issaquah was a member of the committee. This process was part of a county-wide effort to update all city addendums that were developed in conjunction with the 2004 King County Hazards Mitigation Plan, and also invite new members which were not part of the previous plan.

Forty agencies agreed to commit to the development of King County's first multi-jurisdictional hazard mitigation planning effort. Of the original forty, twenty-one agencies actively participated in weekly work group sessions and monthly participant meetings for the 2009 update. Their specific involvement included many activities such as collection and development of data, providing input, reviewing the plan document, and submitting formal documentation identifying their intent to adopt the final approved plan.

Participating Agencies

Table 2-1 King County Government Departments / Agencies and Cities

	2004	2009
King County *	X	x
City of Auburn	X	pending
City of Bellevue	X	x
City of Bothell	X	x
City of Burien	X	x
City of Des Moines		x
City of Duvall	X	
City of Federal Way	X	x
City of Issaquah	X	x
City of Kirkland	X	
City of Medina	X	x
City of Newcastle		x
City of Normandy Park	X	
City of North Bend	X	
City of Pacific		x
City of Redmond	X	
City of SeaTac	X	
City of Tukwila		pending
City of Woodinville	X	

Source: King County RHMP Participating agencies

** Conglomerate of multiple King County Agencies from the RHMP 2004*

Table 2-2: Fire Districts

	2004	2009
KCFD #2 -- Burien/Normandy Park	X	
KCFD #11 -- North Highline Fire District	X	
KCFD #20 -- Skyway/Bryn Mawr/Lakeridge		x
KCFD #36 -- Woodinville Fire and Life Safety	X	
KCFD #39 South King Fire & Rescue (annexed Federal Way and Des Moines)	X	x
KCFD #40 -- Spring Glen/Cascade/Fairwood	X	
KCFD #43 -- Maple Valley Fire and Life Safety	X	x
KCFD #44 -- Mountain View Fire and Rescue	X	
KCFD #45 -- Duvall	X	

Source: RHMP Participating agencies; 2009 WA Fire Service Directory

Table 2-3: Utility Districts

	2004	2009
Cedar River Water and Sewer District	X	
Coal Creek Utility District -- Newcastle	X	
Covington Water District	X	x
Highline Water District		x
KC Water District #19 -- Vashon Island	X	x
KC Water District #20 -- Burien/ Riverton/ McMicken Heights	X	

KC Water District #90 – Renton	X	x
KC Water District #111	X	x
Midway Sewer District, Kent/Des Moines	X	x
Northshore Utility District	X	
Ronald Waste Water District	X	
Sammamish Water and Sewer District		x
Shoreline Water District	X	
Soos Creek Water and Sewer	X	x
Southwest Suburban Sewer District	X	pending
Val Vue Sewer District	X	
Woodinville Water District	X	
<i>Source: RHMP Participating agencies</i>		

Table 2-4: School Districts		
	2004	2009
Federal Way School District		pending
Lake Washington School District	x	
Vashon Island School District	x	
<i>Source: RHMP Participating agencies</i>		

Phase II: Hazard Identification Vulnerability Assessment (HIVA)

Phase II of the process focused on reviewing and identifying new relationships between hazards, vulnerable systems within the community and existing capabilities. The Hazard Identification Vulnerability Assessment, or HIVA as it is known, is a document that lists the hazards in the community, presents the history of the hazards, and identifies the potential for occurrences and impact of each disaster relating to these hazards. The document is designed to outline what the community needs are in terms of emergency management, what has or can be done to mitigate hazards, and what the priorities are in providing resources to plan and prepare for disasters relating to identified hazards.

While, during the 2004 planning process the City of Issaquah relied on the King County HIVA, the City has since developed and incorporated an Issaquah specific HIVA for the 2009 hazard mitigation plan update.

Phase III: Developing a Mitigation Strategy, Capabilities, Implementation, Maintenance and Adoption

The City's Emergency Management Planning Group assisted in the development of mitigation actions that seek to reduce the City's exposure to hazards. The City of Issaquah's EMPG reviewed the City's hazards, ranked the hazards by impact and probability and identified mitigation strategies that would reduce the impact of hazards on the Issaquah community.

Additionally, the Emergency Management Planning Group discussed a schedule and strategy for continued plan implementation and maintenance and developed a list of capabilities which would strengthen mitigation activities.

The 2009 update to the Regional Hazard Mitigation Plan was introduced to the City Council through Agenda Bill #6004 and referred to the Services and Operations Committee for oversight and review.

The Services and Operation Committee reviewed the plan at a public meeting and, when satisfied with the document, forwarded the plan to the entire City Council for consideration.

COMMUNITY PROFILE

The following section describes the City of Issaquah from various perspectives to help define and understand the City's exposures and defenses to potential hazards. Exposure factors can be defined as those community assets and characteristics that may be impacted by known hazards, (e.g., special populations, economic factors, and historic and cultural resources). Community defense factors can be defined as the community's ability to manage risk and adapt to hazard event impacts (e.g., governmental structure, agency missions and directives, and plans, policies, and programs). The information in this section represents a snapshot of the current exposure and defense factors in the City when the plan was developed. The information documented below, along with information from the HIVA, should be used as the local level rationale for the City's risk reduction actions. The identification of actions that reduce the city's exposure and increase its defenses assists in reducing overall risk.

The City of Issaquah is located at the South end of Lake Sammamish fifteen miles East of Seattle. Occupying 11.5 square miles and bisected by Interstate 90; Issaquah covers portions of three mountains, two valleys and a plateau, and includes four major stream systems. Incorporated in 1892 with a coal mining history, Issaquah has become a diverse, rapidly growing community of 26,320 people. The economy of Issaquah includes a mix of retail, office, commercial and some light industry with a number of major employers including Costco and Microsoft. The City of Issaquah is a full service city with its own police department and owns and operates water, sewer and storm water utilities. Eastside Fire and Rescue provides fire and medical services.

The City of Issaquah is governed by a seven member City Council elected at large from the general population. An elected Mayor oversees the executive branch of government with the City Administrator responsible for day to day operations.

A proposal is brought before the City Council through an Agenda Bill process for review by a Council committee before it is drafted in final form for adoption by either ordinance or resolution by City Council at a public meeting. All City Council committee meetings are open to the public and each agenda provides opportunities for the public to speak to the City Council regarding items on the agenda. Except for confidential information, all emergency management plans and programs are available for public review at City Hall, the local libraries and the City's web site.

Funding Sources and Services

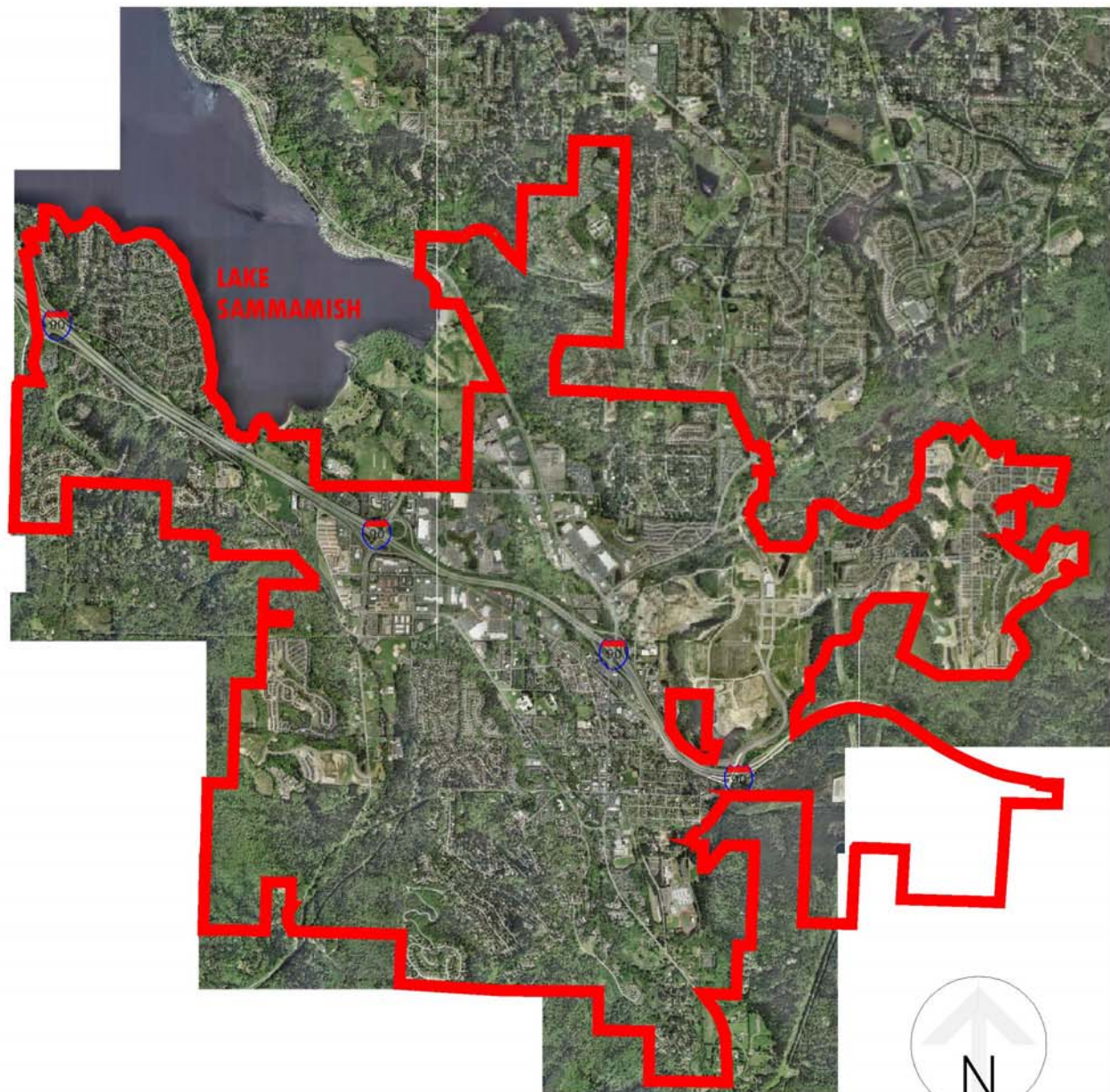
The City of Issaquah's General Fund receives the majority of its revenue from sales tax and property tax. The remaining revenue comes from Utility taxes, B&O taxes, licenses and permits, charges for services, investment interest and grants.

The primary source of utility revenue in the Water, Sewer and Storm Water funds are charges for services with incidental revenues from the sale of meters, investment interest and inspection fees.

The City has its own police department, and contracts for fire protection through Eastside Fire & Rescue. Water utilities include the City of Issaquah, the Sammamish Plateau Water District, the City of Bellevue, the Overdale Water Association, and the Cascade Water Alliance. The City of Issaquah, and the Sammamish Plateau Water and Sewer District, depending on the residence or

business location in the City, provide sewer service. Sewer treatment is provided by King County (Metro). Puget Sound Energy provides gas and electric service.

Despite the growth that has occurred, Issaquah holds the second largest amount of Parks and Open Space in East King County and the third largest amount in King County (King County Benchmarks, 2004). This statistic reflects the City's success in balancing required growth with the desire to maintain the natural elements of the City.



CITY OF
ISSAQUAH

AREIAL PHOTO WITH
CITY LIMITS

Housing

Housing type and year-built dates are important factors in mitigation planning. Certain housing types tend to be less disaster resistant and warrant special attention: mobile homes, for example, are generally more prone to wind and water damage than standard stick-built homes. Generally the older the home is, the greater the risk of damage from natural disasters. This is because stricter building codes have been developed following improved scientific understanding of plate tectonics and earthquake risk. For example, structures built after the late 1970's in the Northwest use earthquake resistant designs and construction techniques. In addition, FEMA began assisting communities with floodplain mapping during the 1970's, and communities developed ordinances that required homes in the floodplain to be elevated to one foot above Base Flood Elevation.

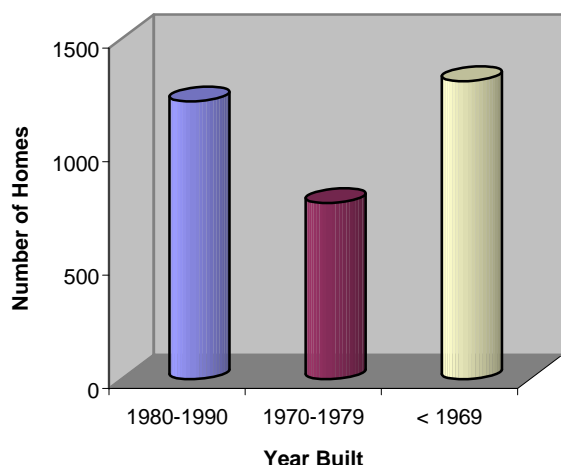
Issaquah's housing stock is a mixture of small and large single family homes, town homes, condominiums, manufactured homes, senior housing and apartments. The City's downtown is home to many older and smaller homes, many of which are still in good condition. The surrounding areas, including the newly annexed areas, reflect a more recent suburbanized pattern of larger lots and homes.

In 1990, the ratio of single family to multifamily homes within the City was evenly split; however, nearly three quarters of the homes in the Potential Annexation Areas are single family structures. Other housing types, such as group homes or mobile or manufactured homes represent less than one percent of the City's total housing stock.

The number of owner occupied homes within city limits is nearly equal to the number of rental units; however in the potential annexation areas that surround Issaquah, over 80 percent of the homes are owner occupied.

The age of the City's housing stock reflects both Issaquah's historic character and its recent growth spurt. Nearly 40 percent of the existing housing stock was constructed prior to 1970, and another 37 percent was constructed after 1980. Figures from the 2010 Census will show that Issaquah's housing stock increased substantially during the 2000s. That trend will most likely taper off in the following decade as new developments such as Issaquah Highlands and East Village reach build-out.

Table H – 1 Age of Issaquah's Housing Stock

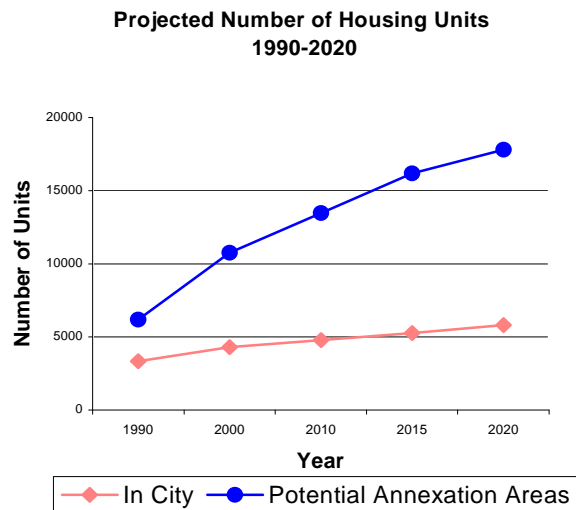


The age of a city's housing stock is important in determining the future housing need. Areas with a lot of older housing, especially if in disrepair, may be ripe for redevelopment, or could provide a good resource for affordable housing.

During the development of the Comprehensive Plan in 1995, the City set a 20-year housing target, which is the number of new households the City anticipated to be created by 2015. Because of a series of annexations, the City in 1999 revised this 20-year housing target to 3,380 new housing units to be built by 2015, which represents almost a doubling of housing units that existed in the City in 1990.

The distribution of the new housing will depend on the availability of land. Limited infill is expected to occur in the older downtown core, which is mostly built out, while much of the new housing growth is expected to occur in the urban villages or in the potential annexation areas, as services allow. ¹

Table H - 2



The City's population growth over the planning period has been recorded from the year 2000 to 2008. The growth rate is estimated using King County's projected 0.5 percent annual growth rate from 2008 to 2022 and taking into account the planned developments of the Urban Villages, the Issaquah Highlands and Talus which are in the development "pipeline."

These projections include the numerous annexations since 1995. The population within the City is expected to grow to at least 30,000 by the year 2022. Much of this growth is attributable to the Urban Villages; Issaquah Highlands and Talus, and to the annexation of North Issaquah, Providence Point/Hans Jensen, and the Greenwood Point areas. Population growth in Issaquah consistently has been greater than the King County average.

Table L-2 Population and Household Projection																		
Based on an estimated 0.5% annual growth from April 1, 2008 to April 1, 2022 plus Council approved growth in the Urban Villages Issaquah Planning Department																		
				Current Population ¹ and Households (HH)			Estimated Population and Household Growth April 1, 2006 to April 1, 2022											
				2008			Estimated April 1, 2011 ⁸			Estimated April 1, 2015 ⁸			Estimated April 1, 2020			Estimated April 1, 2022		
Issaquah by Area	OF M Occ up. Rate ⁹	OFM Avg. Persons/ H H	Acr eag e ⁴	Popul ation ¹	Uni ts	HH	Pop ulati on	Un its	H H	Pop ulati on	Un its	H H	Pop ulati on	Un its	H H	Pop ulati on	Un its	H H
Issaquah minus Villages	0.95 258 1	2.226	5,5 87	17,17 6	8,10 0	7,7 16	17,4 34	8,2 22	7,8 32	17,7 86	8,3 88	7,9 90	18,2 35	8,6 00	8,1 92	18,4 18	8,6 86	8,2 74
Issaquah Highland s ²	0.95 258 1	2.226	809	6,015	2,83 7	2,7 02	7,29 5	3,4 40	3,2 77	7,29 5	3,4 40	3,2 77	7,29 5	3,4 40	3,2 77	7,29 5	3,4 40	3,2 77
Talus Village ³	0.95 258 1	2.226	660	2,611	1,23 1	1,1 73	3,19 7	1,5 08	1,4 36	3,64 6	1,7 20	1,6 38	3,89 6	1,8 37	1,7 50	3,89 6	1,8 37	1,7 50
Issaquah and Villages Total			7,0 56	25,80 5	12,1 68	11, 591	27,9 26	13, 17 0	12, 53 1	28,7 27	13, 61 0	12, 92 3	29,4 26	13, 94 0	13, 23 7	29,6 09	13, 96 3	13, 30 1
	Est.Gro up Quarters ⁵			515			600			700			800			900		
City of Issaquah	Total (OFM)			26,32 0			28,5 26			29,4 27			30,2 26			30,5 09		
1995 Populatio n 9,025 (OFM)		2000 Population OFM	110 56	Approx. 138% Increase (Period with large annexations) 2000-2008			Approx. 8.8% Increase 2008-2011			Approx. 3.1 % Increase 2011-2015			Approx. 2.7% Increase 2015-2020			Approx. 1% Increase 2020-2022		

Potential Annexation Areas (PAAs) Estimates																		
PAA'S	OF M Occ up. Rate ⁹	Est. Persons/ HH	Acr eag e	Popul ation	Uni ts	HH	Pop ulati on	Un its	H H	Pop ulati on	Un its	H H	Pop ulati on	U nits	H H	Pop ulati on	Un its	H H
East Cougar Mountain ⁶	0.9 525 81	2.75	776	201	77	73	206	79	75	212	81	77	217	83	79	220	84	80
Issaquah ⁶⁹		0.00	40	0	0	0	0		0	0		0	0		0	0		0
Klahanie ⁷	0.9 525 81	3.13	1,2 42	11,11 8	3,72 4	3,5 47	11,2 71	3,7 80	3,6 01	11,2 71	3,7 80	3,6 01	11,2 71	3,7 80	3,6 01	11,2 71	3,7 80	3,6 01
Lk Samm St. Park		0.00	512	0	0	0	0		0	0		0	0		0	0		0
King County Island		0.00	28	0	0	0	0		0	0		0	0		0	0		0

PAA Subtotal																
		2,598		3,801			3,860			3,862			3,864			
Issaquah Middle School	5															
Issaquah + PAAs	9,659	37,639	15,969	15,211	40,003	17,030	16,196	40,910	17,472	16,590	41,714	17,804	16,906	42,000	17,828	16,971

1. The Washington State Office of Financial Management (OFM) provided the 2008 Total Population figures as of April 1, 2008. Population = Households (HH) x Persons per HH (OFM).
2. Issaquah Highlands build-out based on 1996 development agreement, Appendix K Capital Facilities Plan. No further infill projected for Issaquah Highlands after expected build out in 2010.
3. Talus build-out is based on the 12/16/99 development agreement, Appendix I Capital Facilities. No further infill is projected for Talus after the expected build out in 2020.
4. Citywide right-of-way areas are not included in the acreage calculations.
5. Group Quarters include facilities such as dormitories and nursing homes. This is a citywide estimate, including group quarters in the urban villages.
6. East Cougar Mountain estimates are based on 2007 King County Assessor data on housing units with the HH size from the 2000 Census.
7. Klahanie PAA estimates are based on the population stated in the 2/17/04 Klahanie/Greenwood Point Annexation Study (Nesbitt Planning & Management, Inc.) with housing unit totals from 2007 King County Assessor data on housing units. HH size was then determined by the Nesbitt population figure relative to the confirmed housing unit figure. Added growth estimates are stopped at the 2011 level due to uncertain infill potential on parcels outside the Klahanie planned community.
8. The 2011 and 2015 estimates reflect a higher rate of growth than the 0.5% annual growth rate due to completion of the urban villages.
9. Households (HH) = Number of units x OFM Occupancy rate of 0.952581(OFM -2008) Ord 2535, effective date 11-03-08

Land Use & Development

The City of Issaquah is primarily located on a valley floor bordered by the steep, forested hillsides of Tiger, Squak and Cougar mountains and by the southern end of Lake Sammamish. The heart of the community is the City's historic downtown. Issaquah Creek and the Fish Hatchery are the predominant presence throughout the city center. Public buildings and amenities create a central campus of destination facilities and areas for community interaction.

Diverse residential neighborhoods and commercial areas fill in the valley's floor. Historic housing areas, multifamily complexes and newer suburban neighborhoods extend the community's characteristic ties to its natural environment. Open spaces, trees, landscaping, parks and recreational areas are interspersed throughout the City. Established neighborhoods are nestled in the surrounding tree-covered hillsides, in close proximity to newer urban villages surrounded by open space environments.

A variety of business uses coexist. The tree-lined Gilman Boulevard, the historic downtown and newer retail complexes combine to meet the needs of residents. The City is the beneficiary of the economic vitality provided by diversity of economic activity; from small to large retail stores; cultural and recreational attractions; and commercial offices that range from home businesses to international corporate headquarters.

The City has invested generously in public parks, open space and recreational properties. Municipal facilities allow a high level of service to residents. Protection of the City's quality of life, natural environment and the small town atmosphere of its downtown core have been major themes in land use decisions.

The Land Use Element of the Comprehensive Plan is the central element for the entire planning process. The land use patterns are what determine the character of the City, and the types and locations of future development and redevelopment. Land use patterns also determine the traffic patterns and the ability or inability to effectively alter those patterns over time. The Comprehensive Plan's Land Use Element is the first step towards defining the unique City character and individual communities by

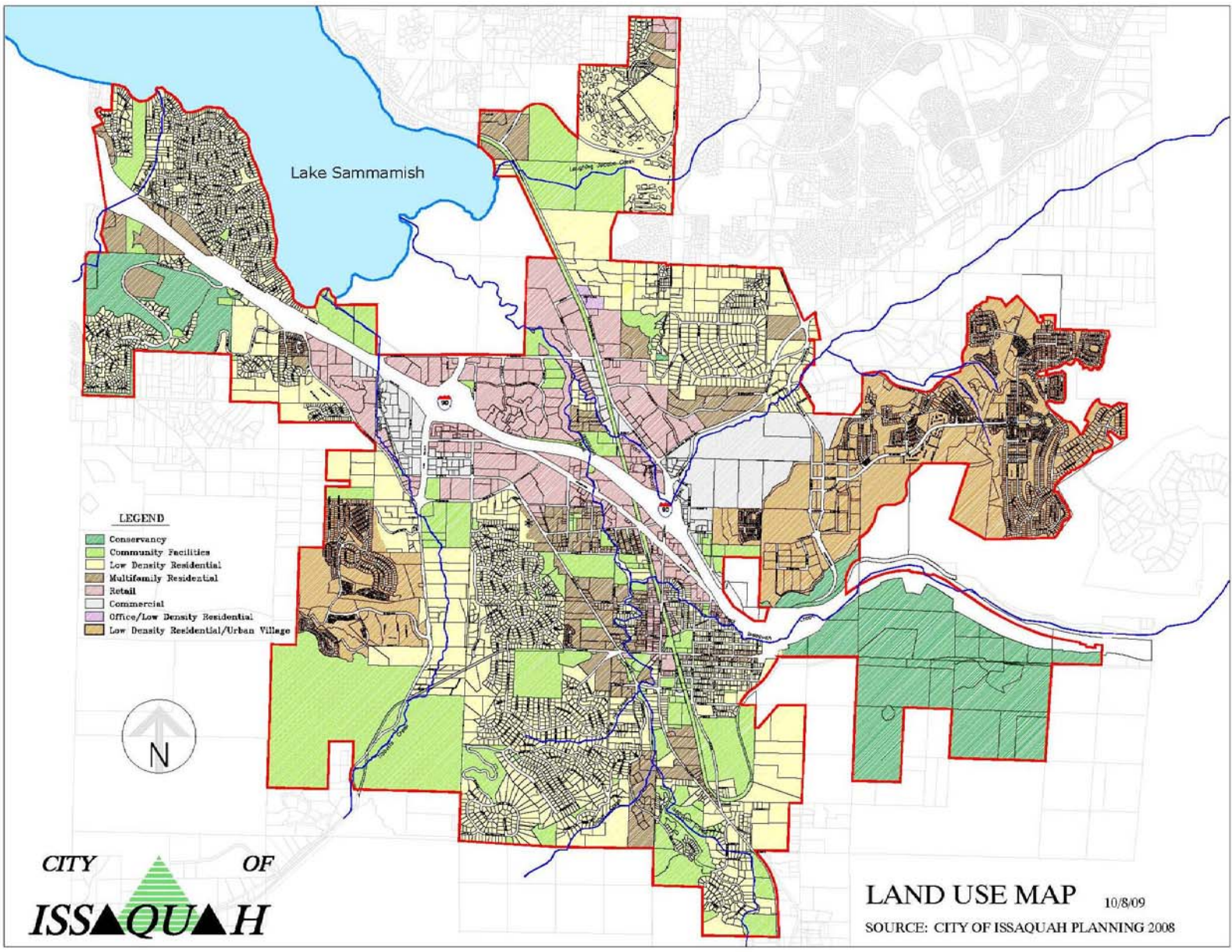
establishing the general framework for the future pattern of growth and development. The Land Use Code, the Zoning Map and other municipal regulations are the second step in the implementation process, creating rules and regulations to further accomplish the vision identified in this plan.

Transportation & Commuting Patterns

In the past 20 years, Issaquah's population has increased by almost 10,000 people and increased to a total of 11.5 square miles. Rapid population growth in surrounding areas such as the Sammamish Plateau and along the Highway 18 corridor have significantly increased the amount of traffic passing through Issaquah to I-90 and other destinations.

The City of Issaquah has bisected by Interstate 90 with State Route 900 near its western edge with principal arterials Issaquah-Hobart Road/ East Lake Sammamish Parkway and Highlands Drive near its eastern borders. Newport Way, Gilman Blvd and SE 56th St. connect eastern and western arterials.

The mountainous terrain surrounding Issaquah restricts principal arterials to valley floors and plateaus, forcing traffic patterns into these areas and limiting alternate routes in the event of road closures. Additionally the only current north south connections are through interstate highway interchanges.



LAND USE MAP 10/8/09
SOURCE: CITY OF ISSAQUAH PLANNING 2008

LEGEND

-  Collector Arterial
-  Minor Arterial
-  Principal Arterial
-  Interstate Highway



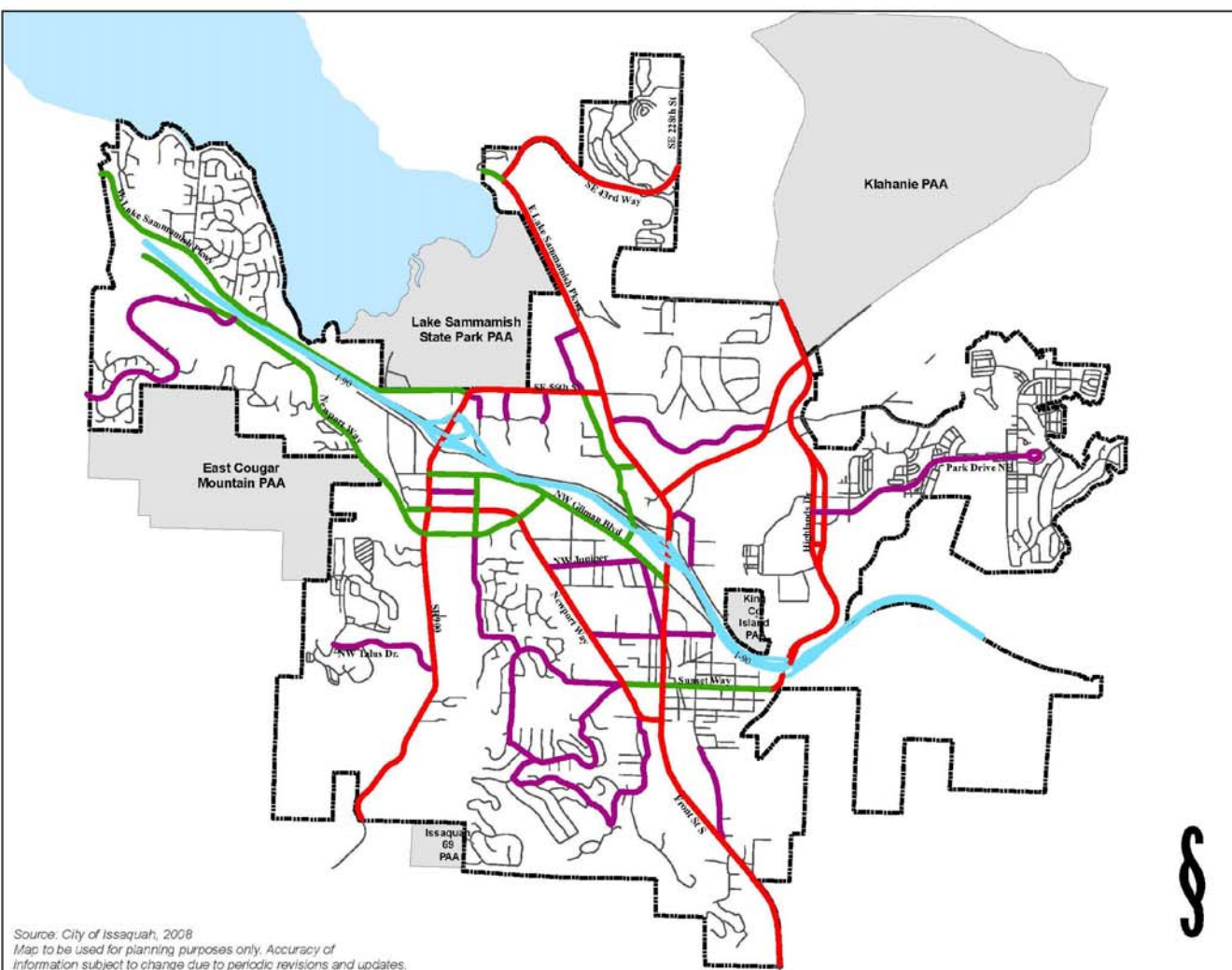
-  City Limits
-  Potential Annexation Areas



Figure 6

**Roadway
Classification
& Inventory**

Ordinance #2535
Effective Date 11/03/08



Source: City of Issaquah, 2008
Map to be used for planning purposes only. Accuracy of
information subject to change due to periodic revisions and updates.

Critical Facilities & Infrastructure

Critical facilities are those that support government and first responders' ability to take action in an emergency. They are a top priority in any comprehensive hazard mitigation plan. The matrix below includes a list of facilities and/or structures that have been determined to be critical in nature, structures or facilities that would seriously impact not only the quality of life in Issaquah, but also the sustainability and survivability of the City residents.

Critical Facilities include:

- Essential facilities, which are necessary for the health and welfare of an area and are essential during the response and recovery phase of a disaster such as: governmental facilities, public safety facilities, schools;
- Transportation systems such as arterial roads;
- Lifeline utility systems such as: potable water, waste water facilities, power grid and communications systems.

City of Issaquah Critical Facilities

Critical Facility Type	Jurisdiction Controlled Facilities	Maximum \$ Loss of Controlled Facilities	Facilities Not Under Jurisdiction Control
Continuity of Government or Administration	City Hall NW City Hall/ Police Station/ Jail City Maintenance Facilities	\$5,086,962 \$15,602,808 \$12,211,500	
Life Safety and Medical	Fire Station #71 Fire Station #72 Fire Station #73	\$4,652,000 \$9,000,000 \$3,489,000	Eastside Fire and Rescue
Transportation	SE 56 th Bridge Gilman Blvd Bridge SW Newport Way Bridge West Sunset Bridge Sycamore Bridge	\$4,652,000 \$5,518,000 \$2,907,500 \$2,907,500 \$2,326,000	I-90 SR-900
Communications	911 Center	Included with Police Station cost.	Qwest Verizon ATT Comcast Bellevue Fire Dispatch EPSCA
Education			Issaquah School District

Utilities	Four water supply wells.	\$6,000,000	Power (PSE) Natural Gas (PSE) Water: Overdale Water Association, Cascade Water Alliance, City of Bellevue, Sammamish Plateau Water and Sewer District. Sewer: Sammamish Plateau Water and Sewer District, City of Bellevue.
	Eleven booster pump stations.	\$9,350,000	
	Seventeen reservoirs	\$43,961,400	
	One hundred-four miles of water main.	\$47,896,992	
	Three sewer pump stations.	\$1,744,500	
	Seventy-one miles of sewer main.	\$43,598,544	
Community Services	Community Center Senior Center	\$6,554,668	

Loss estimates are based on: 1) actual construction costs adjusted for inflation; 2) known costs to construct similar structures; 3) Seattle area building data.

Existing Plans & Policies

Communities often have existing plans and policies that guide and influence land use, land development, and population growth. Such existing plans and policies can include comprehensive plans, zoning ordinances, and technical reports or studies. Plans and policies already in existence have support from local residents, businesses and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, and can adapt easily to changing conditions and needs.

The city of Issaquah's plan includes action items that, when implemented, will reduce the city's vulnerability to natural hazards. Many of these recommendations are consistent with the goals and objectives of the city's existing plans and policies. Implementing the action items through existing plans and policies increases their likelihood of being supported and getting updated, and maximizes the city's resources. The City of Issaquah's Growth Management Act compliant Comprehensive Plan was created in 1995 and most recently revised in 2008. The Comprehensive Plan contains regulations for the zoning of land within the city, and was adopted to promote and protect the public health, safety, and general welfare.

The Planning capabilities Matrix summarizes the plans, codes and ordinances the City of Issaquah uses to ensure potential hazards are properly mitigated during development.

Planning Capabilities

Document	Earthquake/ Seiche	Flooding	Landslide	Severe Weather	Volcano	Wildland Fire	Mines	Epidemic	Chemical	Pipeline	Power Grid	Terrorism	Cyber-Terrorism	Transportation	Urban Fire
Issaquah Land Use Code		X	X	X			X			X					
International Building Codes - 2006	X	X	X	X					X						X
Issaquah Critical Areas Ordinance		X	X				X			X					
Issaquah Flood Hazard Code		X													
Issaquah Water System Plan Comprehensive	X										X				X
National Fire Code						X									X
Issaquah Sewer System Comprehensive Plan											X				
City of Issaquah Comprehensive Plan	X	X	X			X	X							X	X
Issaquah Shoreline Master Plan		X													
Stream Inventory and Habitat Evaluation Study		X													
SEPA		X	X				X		X	X					
Issaquah Spill Response Plan									X						
Pandemic Response Plan								X							
Issaquah Storm Water Ordinance		X													
Issaquah Mine Hazard Code							X								

The City of Issaquah has a strong history of mitigating hazards. The City Hall and Public Works maintenance facilities, constructed in 2001 and 2003 respectively, are designed to be earthquake resistant and resilient to power outages. 800 MHz, VHF and Amateur radios are provided at critical facilities to provide a direct radio communication link to the Regional Communication & Emergency Coordination Center and the State EOC.

Backup power systems have either been installed or made available for all critical City owned utilities and are required for all new utility system utilizing pumping equipment. Critical Water system facilities are designed to the latest earthquake standards.

Issaquah has made substantial improvements in flood hazard mitigation through widening two reaches of the flood channel of Issaquah Creek. The Newport Way and SE 56th St bridges have been replaced with bridges capable of accommodating flood waters. The City's EOC is located in a secure and earthquake resistant building with a backup power supply. Coal mine and landslide hazards have been mitigated through the adoption of a Critical Areas Ordinance regulating development in hazard areas and winter storms are addressed through land development regulations governing road design and emergency vehicle access.

Since adoption of the 2004 HMP flood capacity on tributary 0170 was enhanced through a pre-disaster hazard mitigation grant and a number of flood prone creek side properties have been purchased by the City and designated as open space. City Hall Northwest has been structurally retrofit for earthquake resistance and all City buildings have been fitted with non-structural earthquake restraints. A low power AM radio station was installed to provide information and warning to the Issaquah area.

Community Organizations & Exercises

The City regularly participates in regional exercises including the 2003 Topoff2 national exercise, 2007 Zone 1 exercise and the 2008 Sound Shake exercise. The City will continue to regularly exercise its plans and participate in regional efforts whenever available. The City hosts and co-sponsors a CERT training event for City residents and now has over 150 trained CERT volunteers. The City's Emergency Management Planning Group meets every six weeks to discuss mitigation and preparation issues and maintain the City's compliance with NIMS requirements.

The City's Emergency Management Program was further enhanced in 2008 with the addition of an Emergency Management Coordinator and Public Information Officer.

HAZARD IDENTIFICATION AND VULNERABILITY ASSESSMENT

A significant number of Issaquah's residential community resides on Squak Mountain and Cougar Mountain, portions of which are subject to coal mine subsidence and slide hazards. The residential and commercial areas adjacent to Issaquah Creek and Tibbetts Creek are subject to flooding and have suffered repetitive losses. Additionally, a major thrust fault (Seattle Fault Zone) transects the City along the I-90 corridor which passes through much of the City's commercial and business district creating the potential for significant lost revenues as well as damage in the event of a large earthquake.

Fifteen (15) hazards have been identified within the area and City of Issaquah. They are divided in this report into natural and technological hazards. They are listed here in the order presented in this assessment. The fifteen (15) hazards are:

Natural Hazards

1. Earthquake / Seiche
2. Flooding
3. Landslide
4. Severe Weather
5. Volcano
6. Wildland Fire

Technological Hazards

7. Abandoned Mines
8. Epidemic
9. Chemical and Hazardous Materials Spills and Releases
10. Pipeline Eruption
11. Power Grid Failure (Gas and Electric, Not Severe Weather Related)
12. Terrorism
13. Cyber-terrorism
14. Transportation Emergency
15. Urban Fire

Hazard Ratings

Each hazard identified for the City of Issaquah has been assigned three hazard indices; impact (or severity), probability and frequency. These ratings are not scientific or statistical but are intended only to give a general overall summary of each hazard and its potential effects on Issaquah.

Impact: Criteria for evaluating impact are subjective. There is no known method for evaluating the exact impact of a hazard. The Emergency Management Team reviewed all the hazards in this assessment and categorized the potential impact for each depicted scenario on the scale shown below. The anticipated impact has been **bolded** for each hazard outlined. For the purpose of this document, the highest plausible impact was assigned to each hazard.

Low Impact	Moderate Impact	High Impact
------------	-----------------	--------------------

Probability: This document uses a subjective definition of probability, defined as the chance of future occurrence, using the following system: High probability indicates a history of regular occurrences, or a generally accepted belief within the emergency management community that an event is certain or near certain to occur. Moderate probability is defined as conditions existing that suggest an event may be expected, though not certain, to occur. Low probability is defined as an event being possible, but with a low or remote chance of an actual occurrence.

Frequency: Events with a typical or assumed recurrence interval of more than 100 years are low frequency events. Events with a typical or assumed recurrence interval between twenty-five and 100 years are assigned a moderate frequency rating and events with a typical or assumed recurrence interval of less than twenty-five years receive a high rating.

Natural Hazards Identified

The following hazards incorporate scenarios that will describe the serious potential they pose for the city of Issaquah. Although each hazard may not have the same impact as that outlined in the scenario provided, the Emergency Management Team believes that preparing for the most serious case will allow the city to provide the community with the optimal response to any hazard presented.

Earthquake / Seiche

Scenario The Puget Sound area experiences a shallow magnitude 6.7 earthquake on the Seattle Fault during severe winter weather.

Low Impact	Moderate Impact	High Impact
------------	-----------------	-------------

Life Safety Issue	yes
Property Damage	minor moderate major
% of City Affected	up to 100%
Probability	High
Frequency	Low

The Earthquake Engineering Research Institute recently reported that a magnitude 6.7 quake along the Seattle Fault is “the worst quake Seattle is likely to face in the near future. Ground motions would be two to five times that of the Nisqually Earthquake [which caused an estimated two billion dollars in damage]. A major Seattle Fault earthquake could cause over 1000 deaths...”

“Our best known crustal fault, the Seattle Fault, runs east-west through Seattle from Issaquah to Bremerton. This fault generated a very large earthquake approximately 1100 years ago.”² Frequency is not a consideration, but the impact a major earthquake would have certainly is.

An earthquake would affect up to 100% of the city; a seiche would affect approximately 30% of the city (Lake Sammamish south to I-90).

Background

There are three (3) types of earthquakes within the Puget Sound region. They are subduction zone earthquakes such as the Cascadia Earthquake, deep earthquakes, such as the Nisqually Earthquake, and shallow earthquakes, such as the Seattle Fault Earthquake. Geologic evidence reveals the presence of a major east-west trending fault, called the Seattle Fault, which cuts across Puget Sound from Bainbridge Island through Seattle. This crustal fault would have the highest impact to Issaquah and the entire region. There is a high probability of an earthquake occurring in Puget Sound region, with a high impact to the Issaquah area. The question is when we are going to have another earthquake and what the magnitude and depth of the event is, not if we are going to have another.

History of Events

A large, shallow earthquake estimated at a magnitude of 7.3 occurred on the Seattle Fault about 1,100 years ago, producing tsunamis in Puget Sound and landslides into Lake Washington. Since that time

there have numerous earthquakes in the region with the most notable being the Olympia Earthquake of 1949 (7.1 magnitude), and the Seattle-Tacoma Earthquake of 1965 (6.5 magnitude).

The most recent earthquake of note is the Nisqually Earthquake that occurred on Wednesday, February 28, 2001 at 10:54 A.M. This was an earthquake of 6.8 magnitude, and moderate shaking was felt throughout the Issaquah area.

Hazard Impacts

- **Building collapse and damage:** A major earthquake may cause minor damage to complete destruction of residential, retail and commercial structures. From this damage will come personal injury and/or death, loss of business continuity, power loss, transportation gridlock, and numerous other critical issues.
- **Infrastructure damage:** Infrastructure that has not been upgraded to withstand major earthquakes may fail, and even infrastructure designed to withstand major earthquakes may suffer damage or complete destruction based on the type, location and magnitude of the earthquake.
- **Transportation disruption:** Transportation disruption will range from temporary and minor, major stoppage and rerouting of ground, rail and air transportation, to long-term discontinuation of all service. Overpass structures may be completely destroyed, requiring months to years of reconstruction.
- **Liquefaction damage:** Recent landfill in the area east of Lake Sammamish and north of I-90 is a potential hazard in a major earthquake due to liquefaction. A 2002 report from the Washington State Department of Natural Resources, written titled "*Liquefaction Susceptibility of the Greater Eastside Area, King County, Washington*"³, acknowledges the potential for tremendous physical damage and liquefaction of land in Issaquah and the area, including the shoreline of Lake Sammamish.
- **Basic life support needs** such as heat, electricity, food, shelter, and emergency unit response may be unavailable due to downed power lines and trees, damage to homes and businesses and other earthquake related issues.

Past and Current Mitigation Efforts

Building codes have been improved, retrofitting of older buildings and infrastructure has taken place, and emergency management has focused on this hazard to improve prevention and mitigation of the damage caused by an earthquake. Training staff and the community in ways to prepare for the next major earthquake is an on-going project.

On May 30, 2007, the city of Issaquah ran a Zone 1 Exercise based on a simulated 6.7 magnitude earthquake on the Seattle Fault. Another exercise based on this scenario will take place in March 2008 involving public and private entities in King, Snohomish, and Pierce counties.

The reason for this scenario is the moderate probability of a natural disaster region-wide from this hazard, with a high impact to life and property. Multi-agency coordination in the Puget Sound region

is key to mitigating the effects of this type of event. Training in response to this hazard is an excellent expenditure of time and resources.

The Community Emergency Response Team (C.E.R.T.) has been instituted in Issaquah, with five (5) training sessions completed and more training planned, with C.E.R.T. actively involved in the May 2007 and March 2008 training exercises.

First responders should have access to hazard scenarios in this area to review with their team members at random times throughout the year. This will keep up awareness to such potentials, and will allow for better response should it be required.

Seiche (pronounced saysh)

Background

“A seiche is a standing wave in an enclosed or partly enclosed body of water. Earthquakes may induce seiches in lakes, bays and rivers.”⁴ Earthquakes that can trigger a seiche may occur hundreds of miles from where the seiche affects land.” The probability of a seiche occurring is low, but the impact could be moderate.

Seiche action can affect lakes such as Lake Sammamish. Lake Union encountered a seiche in 2002 after the Denali earthquake in Alaska.

The probability of a seiche occurring is low, but the impact could be moderate in conjunction with a major earthquake in the Puget Sound area.

History of Events

Although a seiche is extremely rare, they have occurred in the Puget Sound region as recently as 2002 after major earthquakes. The 2002 seiche was produced by the Denali Earthquake (7.9 magnitude) centered in Alaska, and damage to water lines, sewer lines, and boat moorages was noted in Seattle’s Lake Union.

Hazard Impacts

Buildings along the shore of Lake Sammamish, as well as docks and boats, could be affected by a seiche. Many residences have been built in the last thirty to forty years along Lake Sammamish that could be affected by a seiche. Again, the probability for damage along Lake Sammamish is low but possible, and the potential for injury/death, as well as property damage, is moderate.

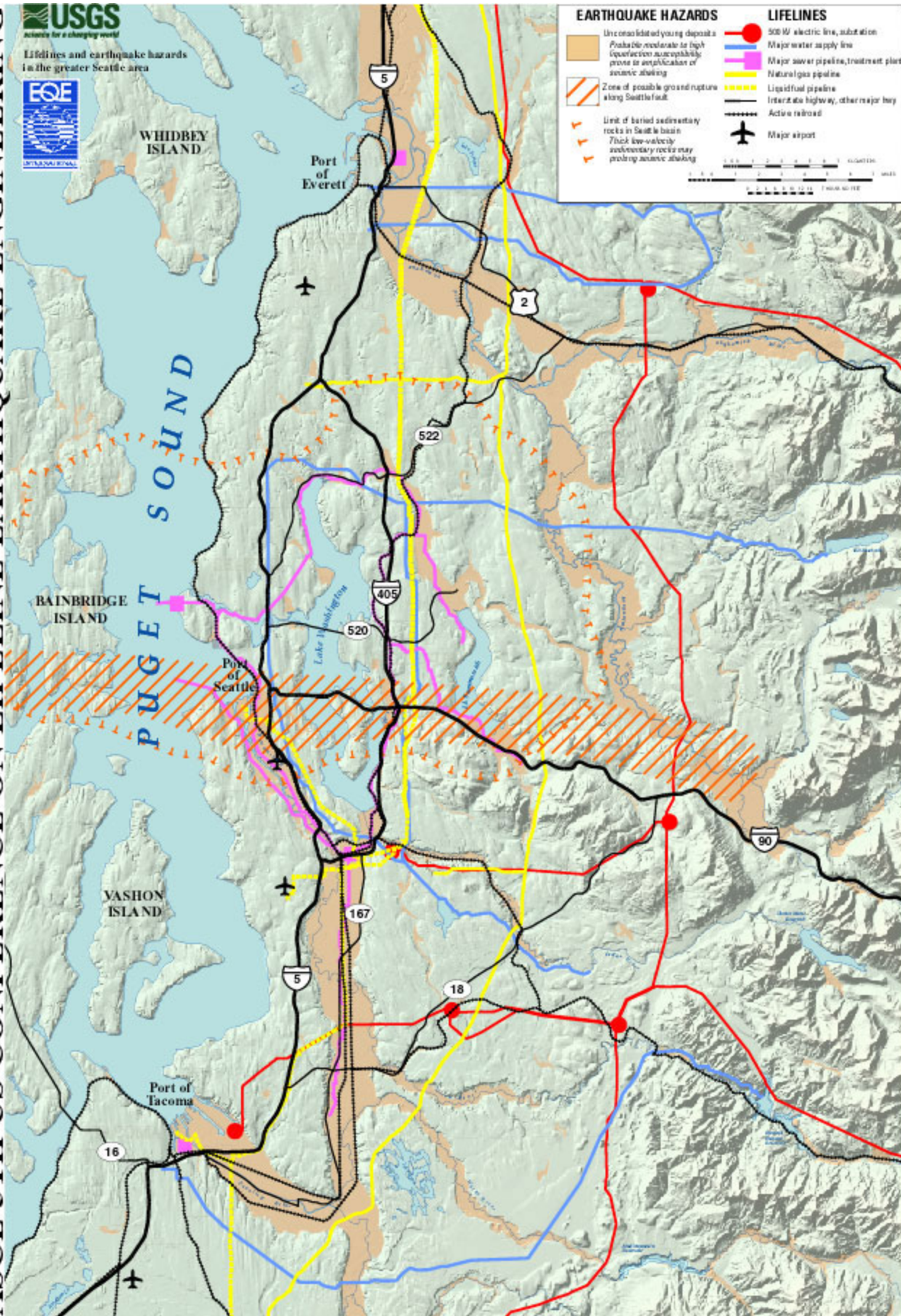
Past and Current Mitigation Efforts

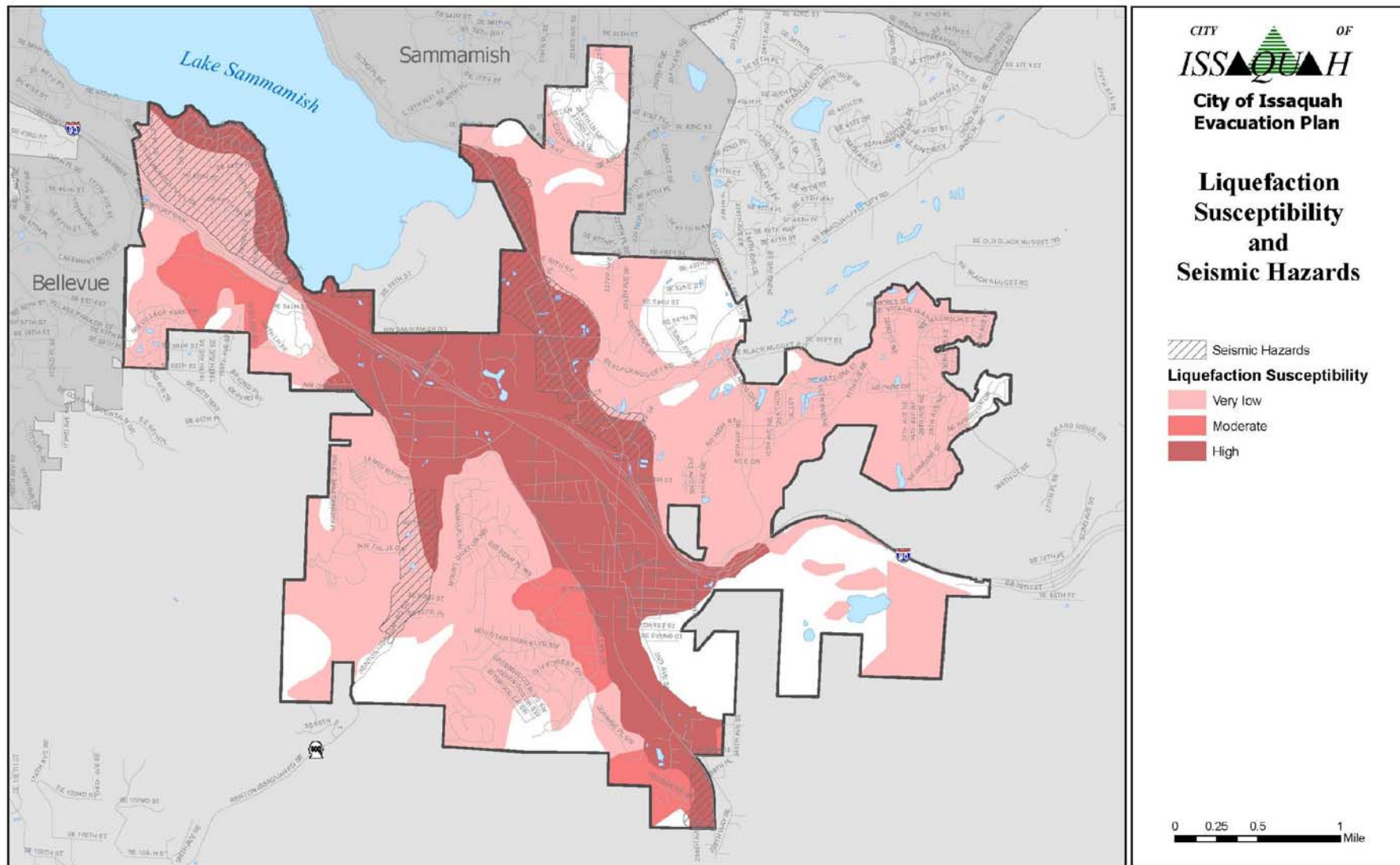
Public education on seiche events needs to be included in earthquake education and preparation. This can be provided through the city’s website, via hard copy brochures, and through in-person education classes.

First responders should have access to hazard scenarios in this area to review with their team members at random times throughout the year. This will keep up awareness to such potentials, and will allow for better response should it be required.

USGS
science for a changing world

Lifelines and earthquake hazards
in the greater Seattle area





Liquefaction Susceptibility & Seismic Hazards - Map 14

Flooding

Scenario Issaquah Creek water flows exceed the 100 Year Flood water with heavy rain forecasted for the next five days. The dams (detention ponds/dams) in the City are reaching capacity and the ground is oversaturated due to the heavy rainfall.

Low Impact	Moderate Impact	High Impact
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Life Safety Issue yes
 Property Damage minor **moderate** major
 % of City Affected approximately 25%
 Probability High
 Frequency High

Lives are certainly at risk during any flood. Five individuals lost their lives in flooding in the Chehalis area of Washington State in December of 2007.

Property damage may be isolated to areas around the major creeks in the City, but property damage could occur to property below or adjacent to dams in the City. The impact may be low to moderate due to mitigation efforts over the last ten years, and the fact that all dams in the City meet seismic regulatory criteria.

Background

Issaquah averages over 62" of precipitation a year, and has a history of flooding along Issaquah Creek. There is no record of flooding due to dam failures.

As recently as 2009, major flooding occurred due to seasonal heavy rains and snow melt. Preparing for this type of hazard is critical and cost effective in preventing injury and/or deaths, as well as reducing property damage and loss of business continuity. There is a still a high probability of major flooding at some locations, but with a low to moderate impact to the Issaquah area due to recent mitigation efforts.

The City of Issaquah has six (6) detention ponds with dams registered with the State of Washington: The information from the State on these detention pond dams is as follows:

Dam#	Record ID	Registered Name	Other Information
1	972	Issaquah Highlands South Pond Dam	Southeast Highlands Area
2	936	Issaquah Highlands NP2 Pond Dam	North of Park Drive
3	941	Issaquah Highlands NPE Pond	North Highlands
4	965	Issaquah Highlands Reid Pond Dam	South Highlands
5	915	Southridge Stormwater Detention Pond	Southwest Highlands
6	930	Talus P5 Stormwater Detention Dam	Talus Area

Dam#	State ID	National ID	Dam Length	Dam Height
1	KI08-688	WA00688	800 feet	27 feet
2	KI08-1858	WA01858	400 feet	28 feet
3	KI08-1867	WA01867	480 feet	23 feet
4	KI08-680	WA00680	250 feet	38 feet

5	KI08-1820	WA01820	430 feet	10 feet
6	KI08-1844	WA01844	400 feet	22 feet

Dam#	Max Storage Feet (in acre feet)	Normal Storage Feet (in acre feet)	Last Inspected	Current Assessment
1	68	1	08/06/2003	Seismic Regulatory Criteria
2	24	19	07/25/2008	Seismic Regulatory Criteria
3	45	11	07/25/2008	Seismic Regulatory Criteria
4	69	62	07/25/2008	Seismic Regulatory Criteria
5	25	22	06/26/2006	Seismic Regulatory Criteria
6	13	1	06/26/2006	Seismic Regulatory Criteria

History of Events

The following summarized information on flooding in Issaquah comes from city generated public documents from 2001 to 2007⁵. There have been numerous events of flooding in Issaquah, with the most serious events occurring in 1986, 1990, 1996 and 2009. The events of February 1996 brought one of the most devastating flooding in many years, and from that event came mitigation to prevent the kind of damage that was sustained in the past. There was minor flooding in 2001 and 2006 along Issaquah Creek.

January 6, 2009 brought the largest flood to Issaquah since 1996. This flood was the result of sustained heavy rains and snow melt in the Issaquah Creek watershed. A number of homes and businesses were damaged by flood waters along Issaquah Creek, East Fork Issaquah Creek and North Fork Issaquah Creek with private property estimated losses totaling between 1 and 1.5 million dollars. Response and recovery efforts totaled approximately \$153,000. Exact water volumes for the January flood are not available due to a significant amount of water bypassing the upstream gauging station via Fifteen Mile Creek; and the lower Issaquah USGS stream gauge not being recalibrated since the Pickering reach channel improvements, but impacts in unmitigated areas were similar to 1996.

There are no recorded dam failures in the City of Issaquah. Dam failures in Washington State average less than one a year per the Washington State Emergency Management Division.

Hazard Impacts

Residential, retail and commercial establishments were impacted along Issaquah Creek. City Hall NW was severely impacted by the 1996 flood event.

Past and Current Mitigation Efforts

The city of Issaquah has constructed many flood improvement projects on local streams since the mid-1990s, in response to severe floods in 1990 and 1996. In addition the city has provided the community with an 8-page document on how they can help prevent flooding as well what the city has done to improve the infrastructure to prevent future occurrences. The brochure is available in a hard copy format as well as through the city's website.

First responders should have access to hazard scenarios in this area to review with their team members at random times throughout the year. This will keep up awareness to such potentials, and will allow for better response should it be required.

Recent and current projects being implemented by Public Works Engineering for improving flood conditions in Issaquah are described below:

Tributary 0170 Drainage Improvement Project

This 2007 project includes work to improve the conveyance capacity of the Tributary 0170 drainage system that runs between the SR-900/I-90 interchange and the Lake Sammamish State Park entrance road, where it discharges to Tibbetts Creek. The objective of this project is to eliminate conditions that caused extensive flooding during the February 1996 flood event. Proposed actions include removal of accumulated sediment, installation of new concrete box culverts under NW Sammamish Road and the State Park entrance road to replace undersized culverts, installing additional culverts at two private driveway culverts. Stream restoration activities include replanting with native vegetation and improving habitat with large woody debris. The city has a drainage easement along the project corridor. The total cost of this project is approximately \$800,000, with \$390,000 funded by a FEMA Pre-Disaster Mitigation Grant that was awarded to the city in 2006.

Tibbetts Creek Greenway Project

One of the purposes of the Tibbetts Creek Greenway Project was to solve flooding problems on Tibbetts Creek. Flooding on Tibbetts Creek was becoming increasingly frequent due to sediment filling the channel. Insufficient channel capacity in most sections of the stream between Tibbetts Valley Park and Lake Sammamish, plus partially clogged culverts under I-90, was also contributing to flooding. This was impacting Tibbetts Valley Park, city roads, and private property in the west end of Issaquah.

During the summer of 2003, as part of the Tibbetts Creek Greenway Project, the city restored 1,500 feet of stream within Tibbetts Valley Park and the adjoining Kelly property. Sediments from the channel were removed, and a pond to trap sediment loads was constructed. Other Tibbetts Creek Greenway Project work that was constructed during the last two years to mitigate flooding include the following:

- Bridge replacements at Newport Way (2001), NW Sammamish Road (2001), and I-90 (2004)
- Bianco Mine Tailings stabilization (2002), to eliminate a source of sediments to the stream
- Restoration of Tibbetts Creek on Rowley property in 2000-2001 (the stream in this area was previously a roadside ditch)

Issaquah Creek Gilman Reach Channel Improvements

The Gilman Area Channel Improvement project, located on Issaquah Creek between I-90 and Juniper Street, was constructed during the summer and fall of 1998. The goal of this project was to reduce flooding by providing increased capacity within the channel to convey flows (equivalent to the 1996 flood). Fish and wildlife habitat of the stream and riparian corridor was also improved by adding large woody debris (LWD) in the creek, planting shrubs and trees along the channel, and creating backwater pooled areas. The project cost was aided by an \$895,000 FEMA hazard mitigation grant (in response to the 1996 federally declared disaster).

Post-construction monitoring, a requirement of permits, will continue for 10 years following construction. In 2003, in response to monitoring report recommendations, the city conducted maintenance of the project. This work included placement of three pieces of large woody debris (stream logs) into the streambed in the area upstream of Gilman Boulevard. This was to replace large woody debris that was lost during the 1998 flood. In addition, 300 pre-rooted willow and dogwood plants were installed into the riprap that line the west bank of the stream between Gilman Boulevard and Locust Street, and the upper portions of the riprap bank were covered with topsoil to help plant growth.

Issaquah Creek Pickering Reach Channel Improvements

The Pickering Reach of Issaquah Creek extends from I-90 to S.E. 56th Street, and was the second phase of channel improvements for Issaquah Creek (after the Gilman Reach). The project included a new 1,000-foot long overflow channel to relieve floodwaters in the main channel. The work was completed from S.E. 56th Street to south of the Pickering Barn in autumn 1998. Funding of the Pickering Area Channel Improvement Project was through the city's stormwater capital fund.

Post-construction monitoring, a requirement of permits, will continue for 10 years following construction. Monitoring has concluded that vegetation has vigorous growth of both installed and volunteer species. In general, stream banks have remained stable and the channel is functioning as designed. Although the channel has undergone some redirection, the overall function of improved flood storage and conveyance, limited erosion, and improved fish and wildlife habitat was achieved.

Issaquah Creek-Bank Enhancements at Issaquah School District Administration Building

In 2000 the city constructed a stream bank stabilization project along Issaquah Creek behind the School District Administration Building on NW Holly Street. Funding for this project was through grants and a contribution from the Issaquah School District. The purpose of this project was to stop an actively meandering stream and eroding bank from threatening the building. Bioengineering, the use of logs and other natural materials, was used to stabilize the bank. In 2003 additional logs were placed to stop erosion after the stream shifted slightly. Included in this project was restoration of native plants on the city-owned and undeveloped Issaquah Creek Park.

Bridge Replacements

Starting in 1995, the city of Issaquah and others embarked on an aggressive program to replace substandard bridges. Bridges replaced in recent years include the following:

- Issaquah Creek: NW Sammamish Road (SE 56th Street), 1995
- Issaquah Creek: Sunset Way, 1997
- East Fork Issaquah Creek: NE Dogwood Street, 1997
- Issaquah Creek: Newport Way (Clark Street), 1999
- Tibbetts Creek: NW Sammamish Road, 2001
- Tibbetts Creek: Newport Way, 2001
- East Fork Issaquah Creek: Rainier Blvd, 2004
- Tibbetts Creek: I-90 (WSDOT), 2004
- Tibbetts Creek: NW Poplar Way (Rowley), 2004
- Issaquah Creek: NW Juniper Street, 2005

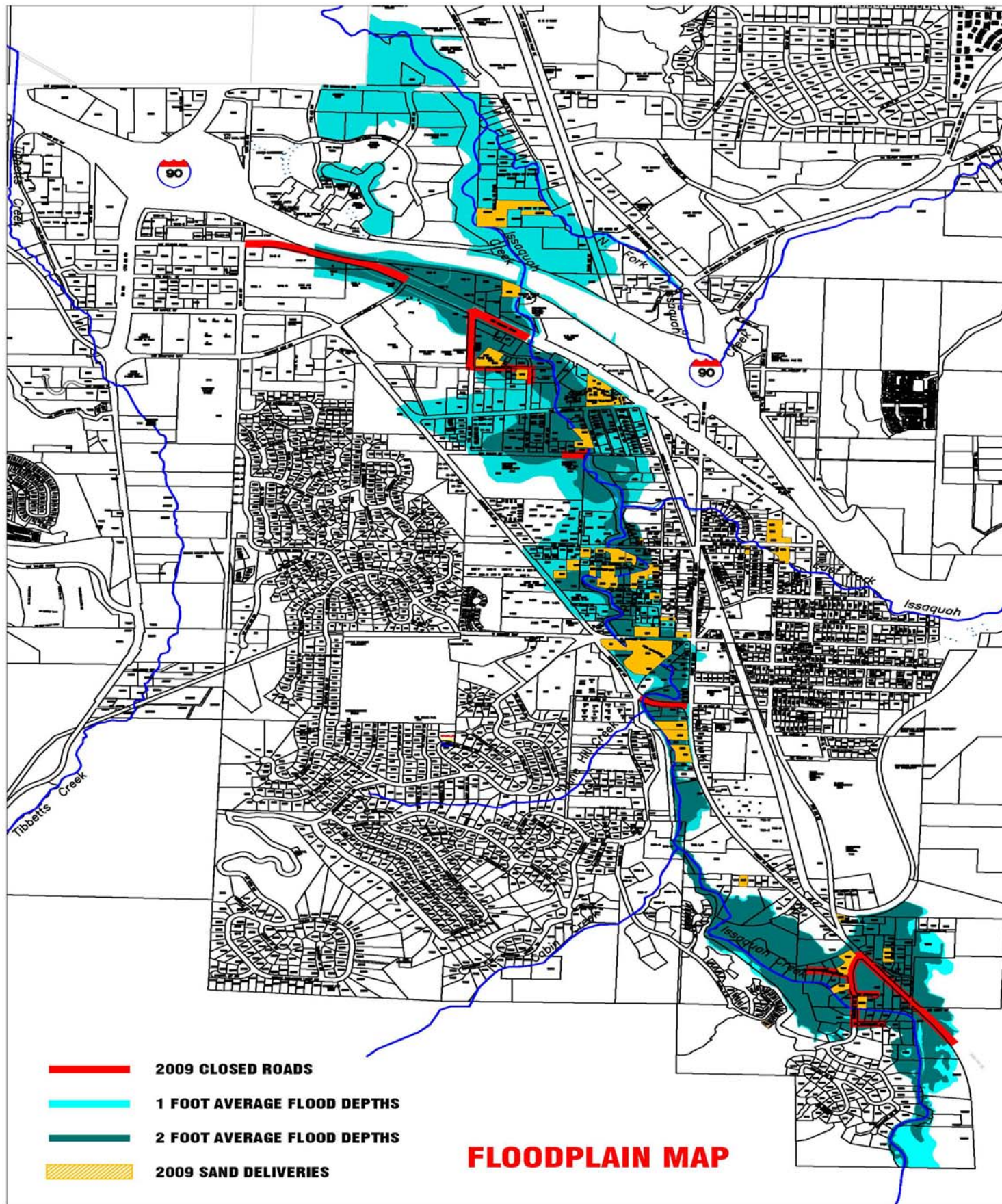
While part of this effort was prompted by bridge safety or traffic improvement concerns, most of the older bridges in the city were significant flood conveyance constrictions. With replacement, flooding conditions in areas upstream of the bridges were significantly improved.

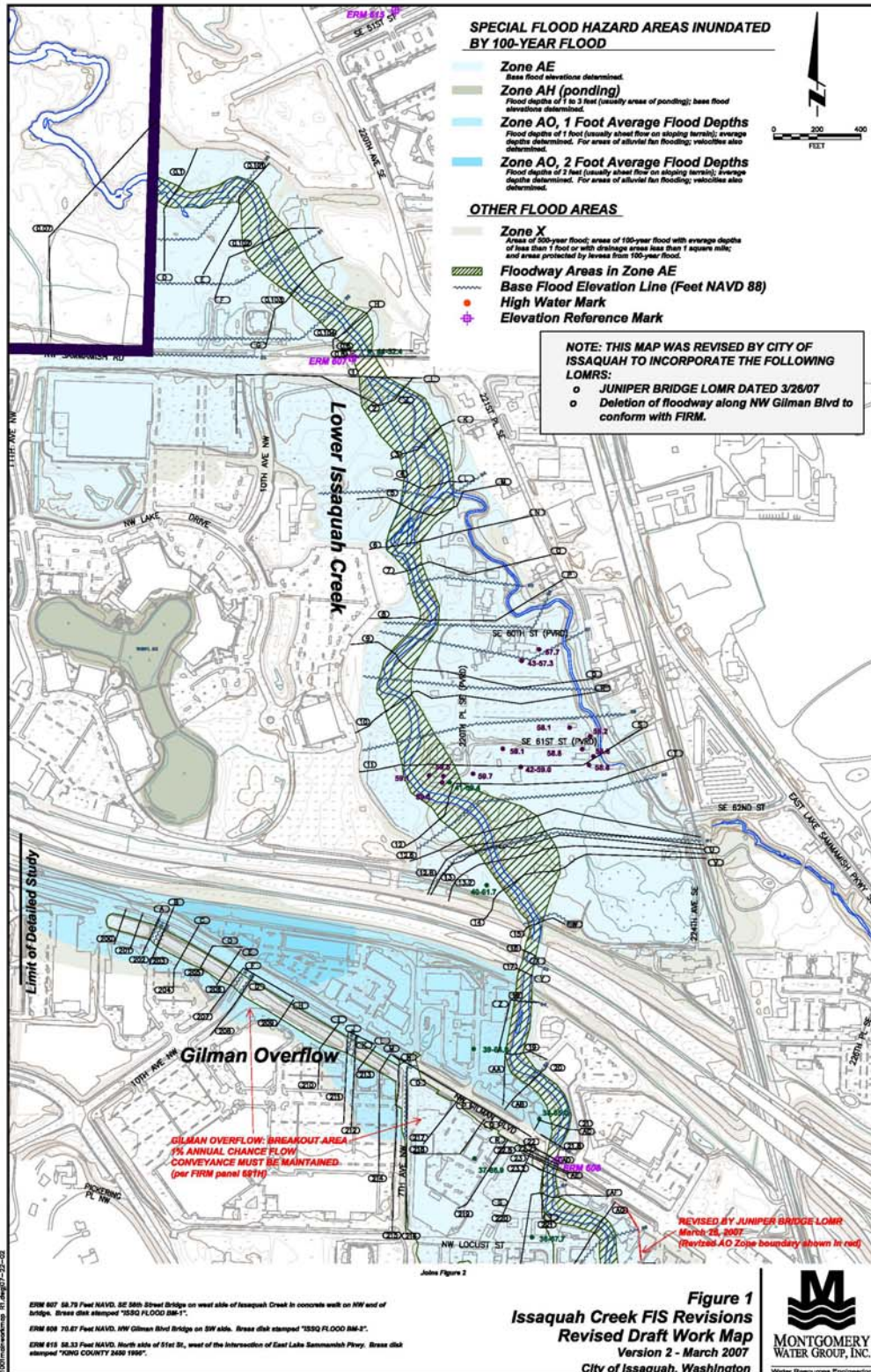
The final major bridge replacement project being planned by the city is at NW Dogwood Street on Issaquah Creek. Scheduling of this project is contingent on obtaining Washington state bridge replacement funds, but work should occur in 2008 or 2009.

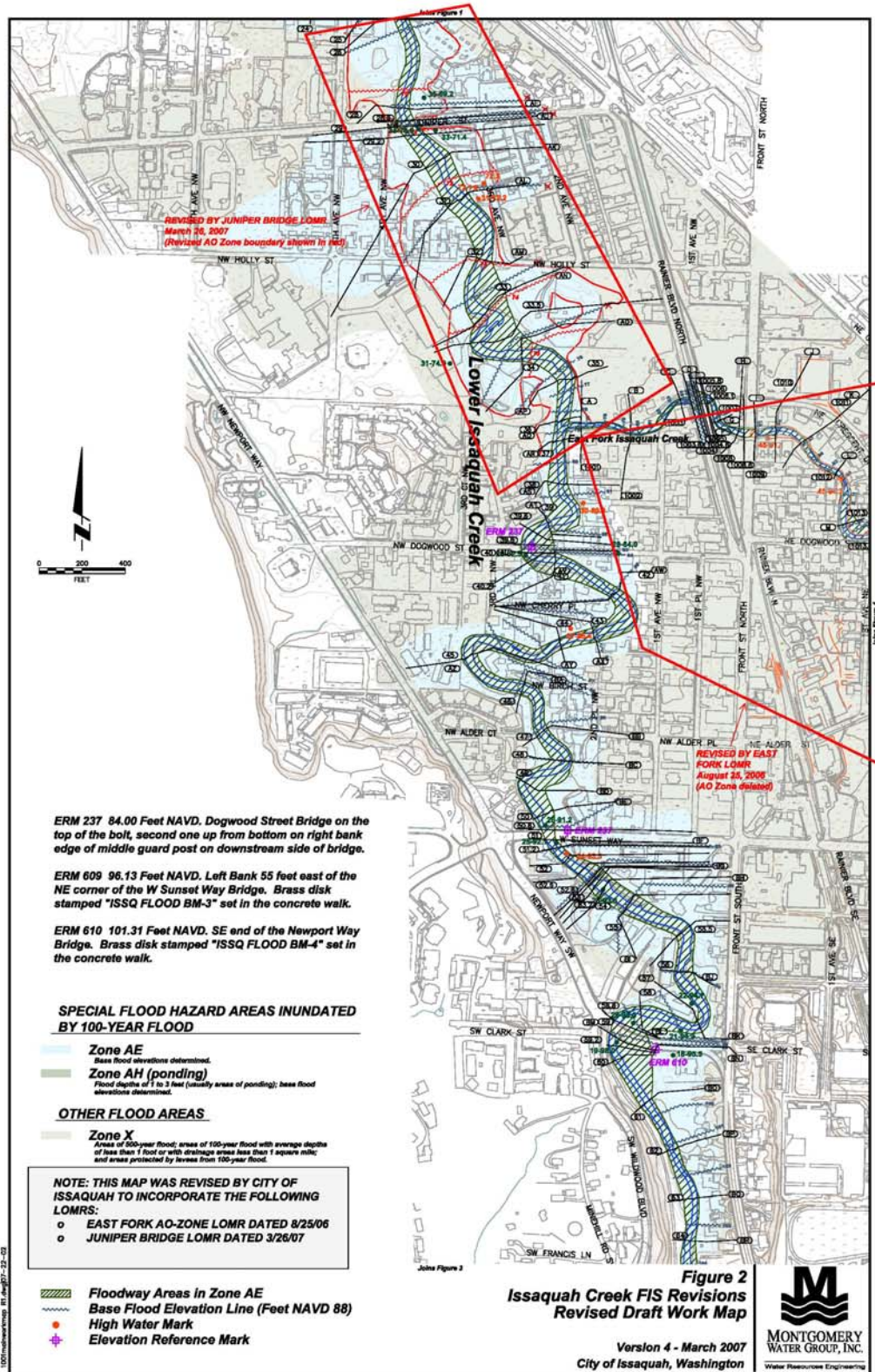
Property Acquisition

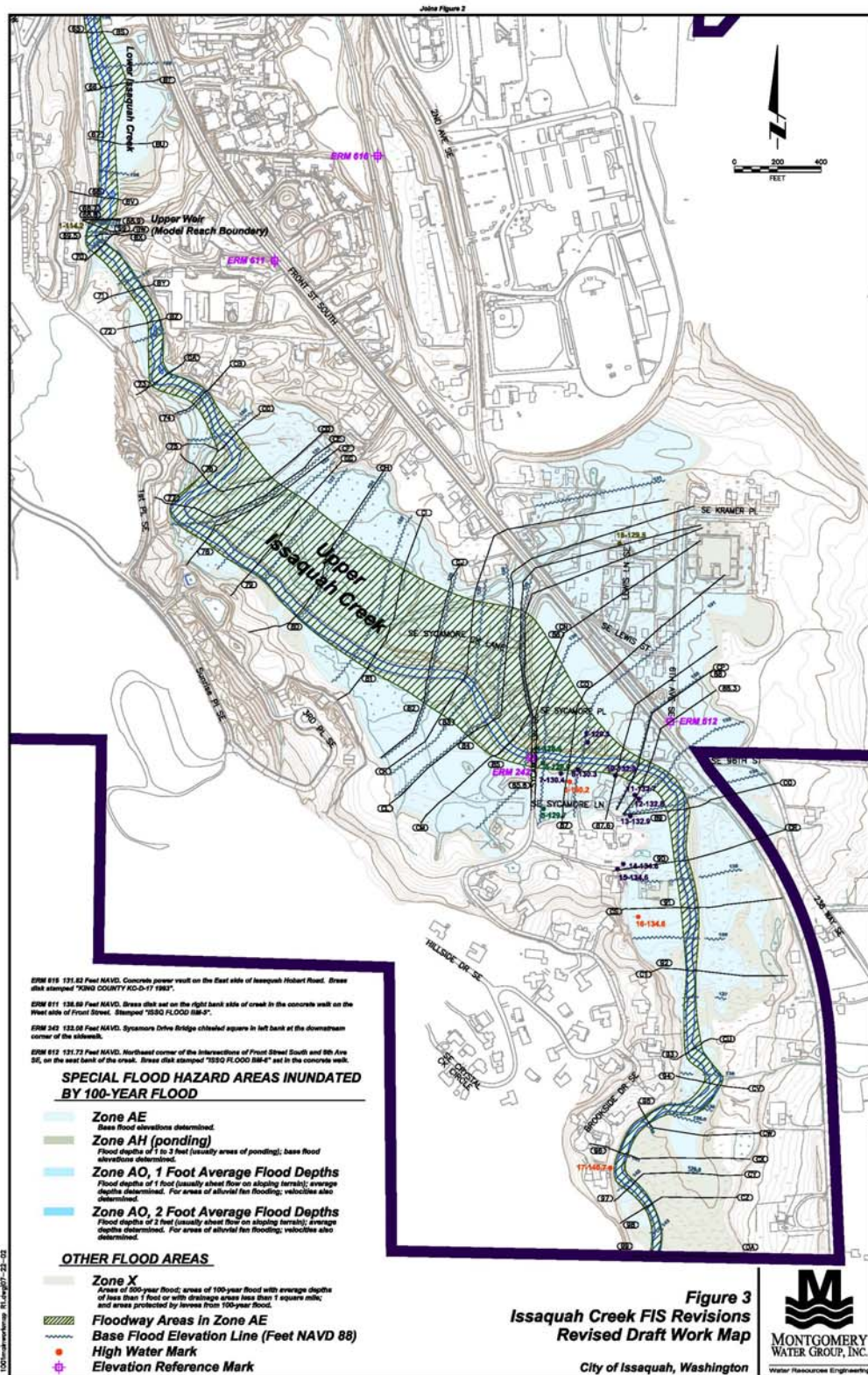
The city allocates money and pursues grant opportunities to purchase developed and undeveloped residential property along local streams. Acquisitions include houses that regularly flood, structures that need to be removed or moved to facilitate a capital project (e.g., bridge replacement, channel project), or vacant land that is a critical link for a capital or stream/habitat restoration project. This fund allows for site restorations such as house removal and stream and vegetation enhancements. The city is also actively pursuing the acquisition of remaining undeveloped parcels along Issaquah Creek, particularly the larger ones that face significant development pressures, for open space preservation. Several large parcels of land have been acquired along Issaquah Creek in recent years.

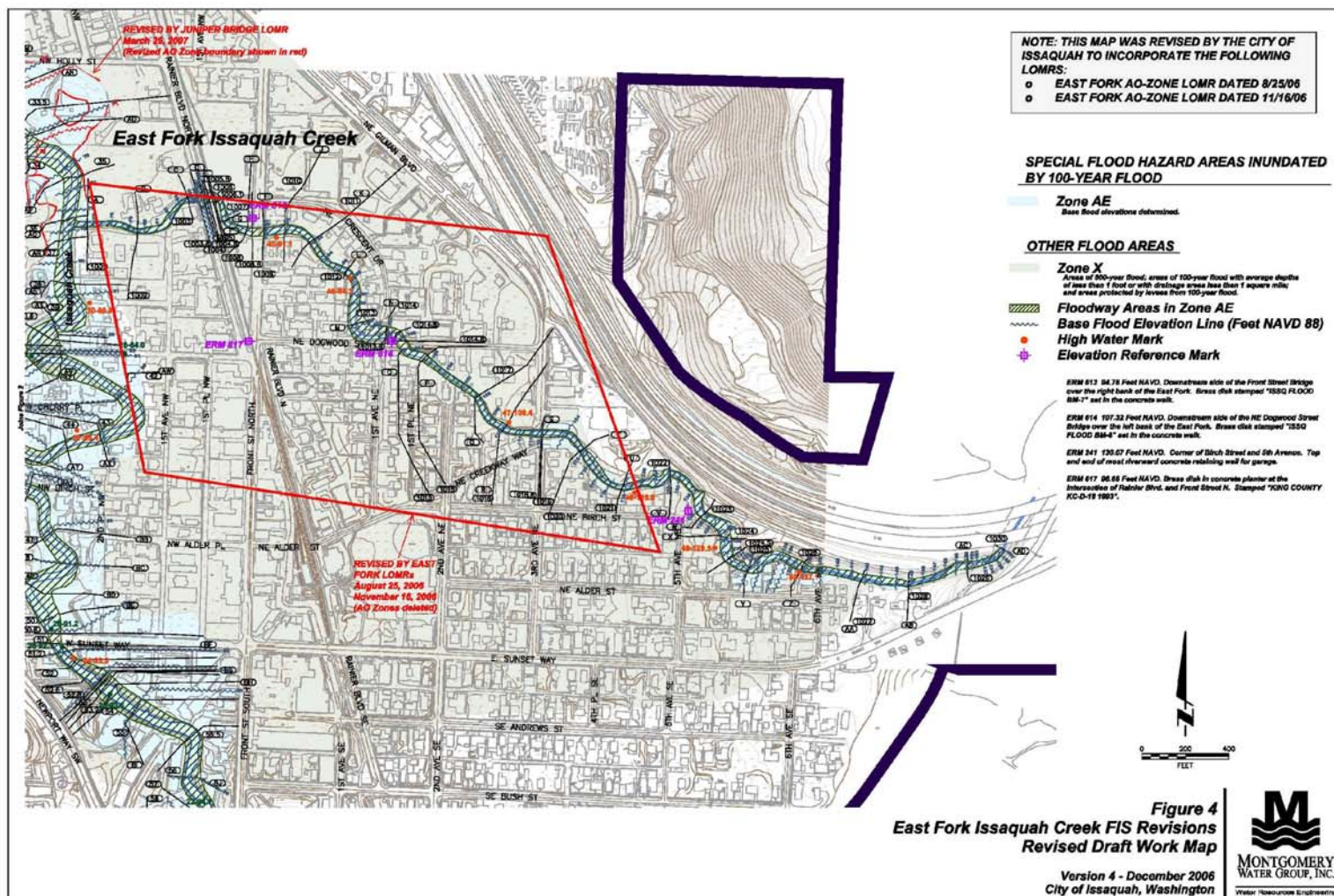
The city continues to negotiate with property owners on potential future acquisitions, but offers are made only as funding becomes available.

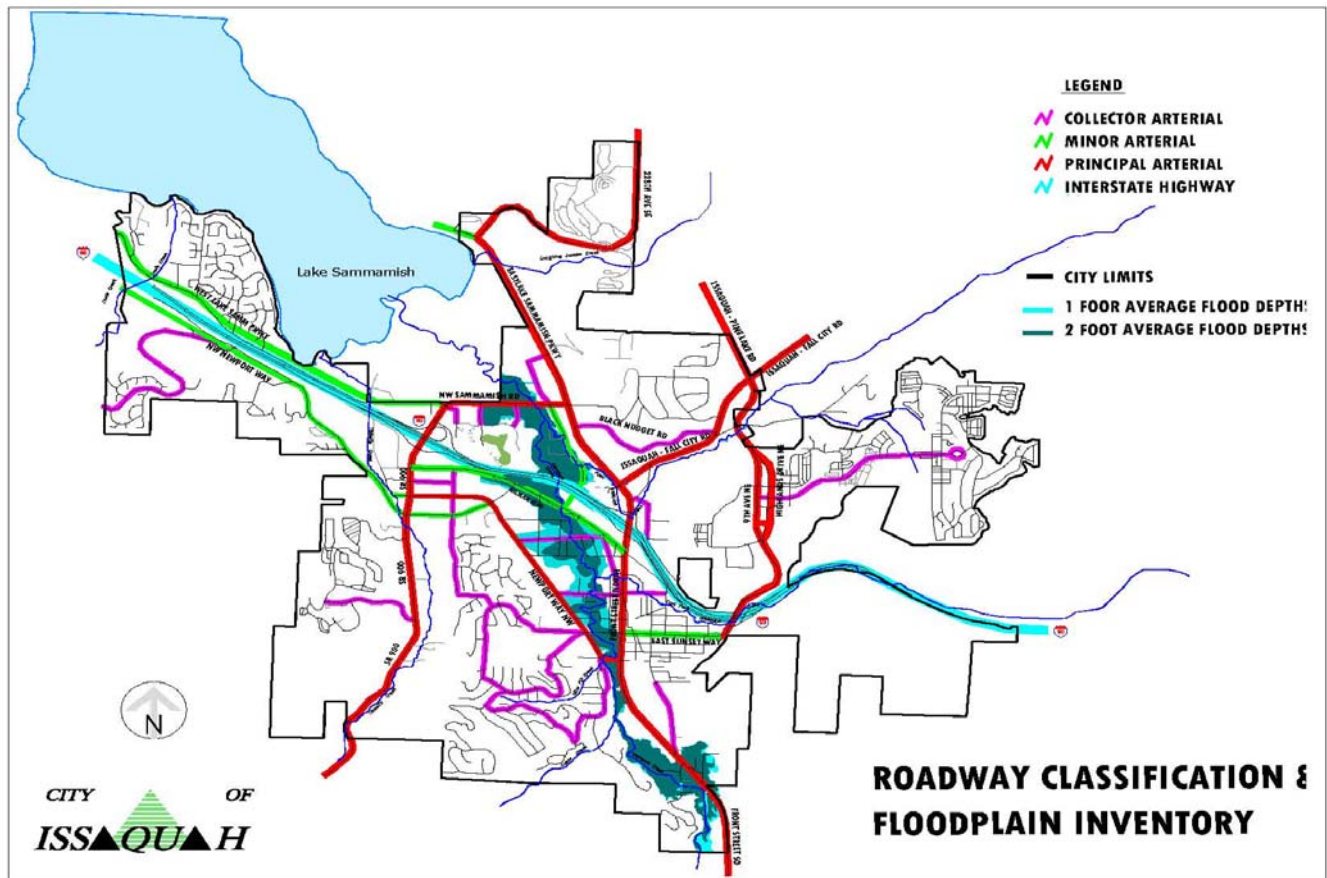












Landslide

Scenario A major landslide on Squak Mountain impacts homes with occupants inside during a severe rainstorm; vehicular emergency response is impossible.

Low Impact	Moderate Impact	High Impact
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Life Safety Issue	yes
Property Damage	minor moderate major
% of City Affected	less than 5%
Probability	Moderate
Frequency	High

Landslides in Issaquah have had a minor impact on life safety and property. Landslides are capable of moving massive amounts of land, trees, and other material, causing deaths and injury. Squak Mountain has recorded minor land slippage over the years.

It is anticipated that a major earthquake will initiate most property damage from a landslide. Landslide damage may be limited to minor to moderate mud flows around private residences.

Background

The city of Issaquah includes a plateau and three mountains that house residents and provide businesses in the community. The potential for landslide is moderate, with a Low impact to lives and property. Coupled with the city's annual rainfall of over 62" a year, and continued building in the hillsides, the community needs to prepare for this type of hazard.

History of Events

January 2004 Camp Creek Landslide

This landslide on the Issaquah Highlands Plateau sent water and mud into Issaquah Creek. The flooding closed the Exit 18 off ramp for 18 hours, and required cleanup of the East and North Forks of Issaquah Creek. Approximately 20,000 cubic yards of soil and rock slid down the hillside from the mouth of Camp Creek.⁷

Other locations in the city where landslides have occurred include:

- Mountainside Drive
- Mount Pilchuck Avenue NW
- Mount Quay Drive
- Foothills Drive
- Sunset Way

- Big Bear Court

In addition to the landslides in Issaquah, there have been five (5) other declared federal disasters involving landslides in Washington State in the past ten (10) years.

Hazard Impacts

Landslides can damage to above ground and underground infrastructure, including stormwater drains, sewer lines, fresh water lines, natural gas lines, power lines and communication lines. The loss of these critical resources causes huge impacts on the community and public safety response, and restoring these resources may take days and even months in the event of a major disaster.

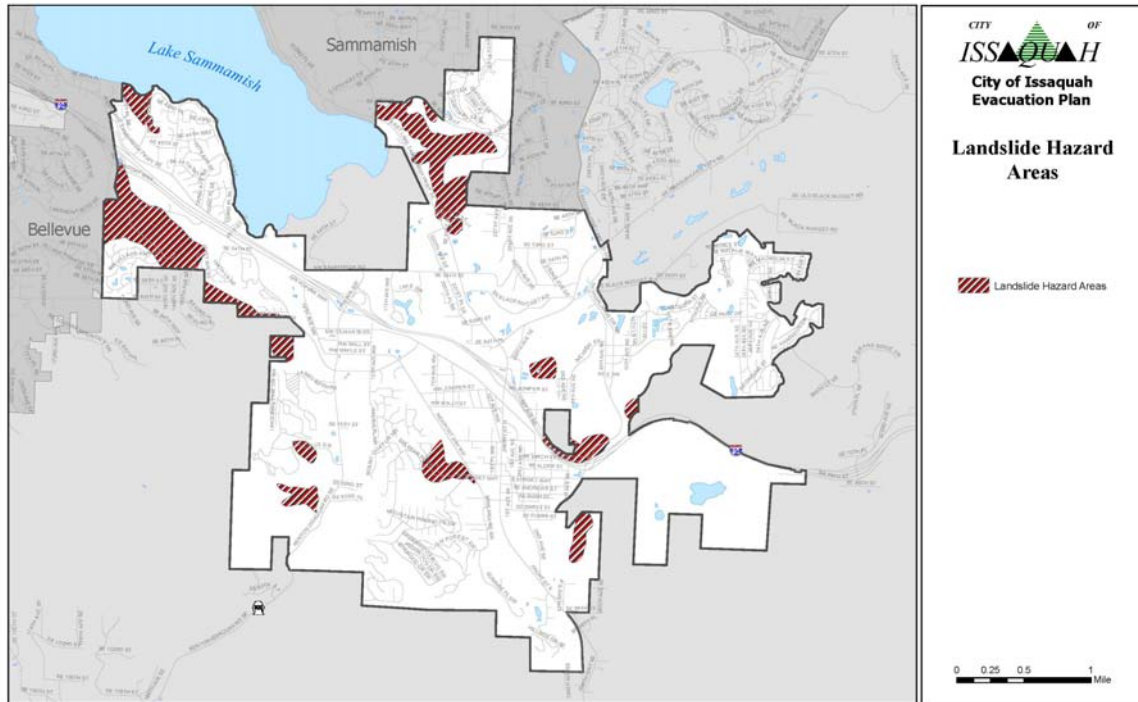
Roadways, homes and businesses can be destroyed or severely damaged by landslides. Injury and loss of life are possible in all landslides.

Clayton Springs in Issaquah Highlands area is another area similar to Camp Creek that has been identified as being a potential area for landslide should drainage become. A blockage here would be similar to the identified cause of the Camp Creek landslide. Another area in the city susceptible to landslides includes the Talus Development off SR-900.

Past and Current Mitigation Efforts

Issaquah building codes have been enacted to mitigate landslide issues, but continued diligence in keeping drainage clear of blockages, careful review of building permits, and required mitigation to prevent building on unstable land is critical on behalf of city staff. Coordination between the Major Development Review Team and other city planning staff is imperative.

First responders should have access to hazard scenarios in this area to review with their team members at random times throughout the year. This will keep up awareness to such potentials, and will allow for better response should it be required.



Data taken from King County Landslide Hazard Map

Landslide Hazard Areas - Map 13

Severe Weather

Scenario Issaquah is hit with wind gusts recorded at 100 mph, knocking out power long-term and downing trees throughout the community during a major winter storm.

Low Impact	Moderate Impact	High Impact
------------	-----------------	-------------

Life Safety Issue	yes
Property Damage	minor moderate major
% of City Affected	100%
Probability	High
Frequency	High

Life safety is directly affected when power to heat homes and businesses is disrupted for extended periods of time. The elderly and frail within the community are especially affected by power outages. The winter storms of 2006, 2007 and 2008 are prime examples of life endangering storms to impact Issaquah.

Property damage can be moderate with downed power lines and trees, as well as local flooding. Transportation congestion due to stalled and abandoned vehicles on the roadways adds to the impact of severe weather.

Background

The windstorms of November and December of 2006, snow and ice storms of January and February of 2007 and the snow storm of 2008 brought some of the worst weather related emergency response in recent history to the Issaquah area. Extreme winds and heavy snowfall caused the city to come to a near standstill for many days.

Winter and spring bring rain, snow and high winds to the region, causing major power outages and diminished ground transportation. The storms of 2006, 2007 and 2008 brought many to understand the need for preparing themselves, their family members, and their residences and businesses for all types of emergencies.

The probability of future severe storms, and the after effects caused by these storms, is high, and the impact of the storms may be far-reaching in the community.

History of Events

The history of Washington State's severe storms is long, with many of the storms requiring federal disaster assistance.⁸ The most recent major events include the following storms:

- 1993 The Inauguration Day Storm on January 20th brought winds of up to 100 mph; 965,000 people in Washington state were without power for extended periods of time
- 1995 High winds created property damage and personal injury throughout Western Washington
- 1996/1997 Severe cold temperatures, and high snow levels stopped ground transportation, collapsed boat marinas, sank over 400 boats and destroyed numerous buildings
- 2006 Severe winds and gusts of nearly 80 mph in the Issaquah area knocked out power; several feet of snow fell in another storm that left hundreds of thousands throughout Western Washington without power for up to weeks at a time. Record setting ice and snow blanketed the area, stranding cars and foot traffic. Issaquah was hard hit by the storm, with some residents taking shelter at emergency locations; emergency services were operational for many days.

- 2008 Three weeks of record snow fall around Washington State and the entire City of Issaquah along with unusually prolonged, cold temperatures combined to produce the worst winter storm of recent history. Regional transportation systems including SeaTac airport were disrupted stranding many travelers and making supply deliveries difficult.

Hazard Impacts

The impact of severe storms may be short in duration, but the impact is far-reaching. Transportation is disrupted to the point that most ground transportation is non-existent during the most severe part of the storm. Basic life support needs such as heat, electricity, food, shelter, and emergency unit response may be unavailable due to downed power lines and trees, damage to homes and businesses, and other storm-related issues.

Past and Current Mitigation Efforts

The city has improved its response to emergencies such as the severe storms of 2006 and 2007 by updating its Emergency Operations Center, Emergency Operations Plan and partnership with other government agencies in King County, Region 1.

The city has implemented the following measures to mitigate the effects of severe storms as well as other hazards in the community:

- Hire an Emergency Management Coordinator to work with the Emergency Management Director in directing preparedness and coordinating efforts before, during and after major emergency incidents
- Purchase emergency generators for the city's Community Center and Senior Center to provide fully operational emergency shelters
- Purchase and install an emergency AM radio system to notify all city residents of the city's response to the activation of local emergency shelters
- Implement a Reverse 911 system to notify residents of impending danger
- Hire an Information Officer to coordinate and facilitate emergency information

First responders should have access to hazard scenarios in this area to review with their team members at random times throughout the year. This will keep up awareness to such potentials, and will allow for better response should it be required.

Volcano

Scenario Mt. Rainier experiences a major volcanic eruption, sending large amounts of ash in a northerly direction towards Issaquah.

Low Impact	Moderate Impact	H High Impact
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Life Safety Issue	yes
Property Damage	minor moderate major
% of City Affected	100%
Probability	High
Frequency	Low

57 people lost their lives in the eruption of Mt. St. Helens in 1980. The exact number of permanent injuries and deaths due to the released ash is unknown. It is known however, that ash can have serious life-threatening consequences for individuals.

The amount of ash that could be released by an eruption of Mt. Rainier is significant, and much closer to Issaquah than Mt. St. Helens. Virtually all of Issaquah would feel the effects of the ash fall. Serious property damage could occur, to include heavy amounts of ash on rooftops, causing roof collapses if the ash should become wet. Vehicles driven during ash fall are subject to major mechanical failure.

Background

The May 18, 1980 eruption of Mount St. Helens in southwest Washington State caused many residents to understand the violent nature and after effects of a volcanic eruption. With three other mountains in Washington State having the potential for eruption, communities and government agencies need to assess the hazard and the impact an eruption could have on them. The probability of an eruption is high as Mt Rainier is classified as an active volcano, and the impact of an eruption, should one occur, is significant.

History of Events

Volcanic events in Washington State have been traced back at least 15,000 years. The more recent events of Mount St. Helens, Mount Rainier, and Mount Baker date back to the mid and late 1800's, and the 1980 eruption of Mount St. Helens.

Hazard Impacts

Issaquah could be affected if Mount St. Helens, Mount Rainier, Mount Baker or Glacier Peak erupted and dispersed ash. Mount Rainier, at approximately 65 miles from Issaquah, and Glacier Peak, at approximately 70 miles from Issaquah, pose the greatest potential of harm to Issaquah. Mount Rainier is considered the greatest overall threat at this time in the state.⁹

A Mount Rainier eruption could trigger lahars that could cause flooding many miles away from Mount Rainier.

Ground and air travel would be either discontinued or done only with preventative measures if ash fallout occurs. Emergency vehicles and equipment need to be outfitted with preventative devices to prevent engines and other mechanical equipment failure. Local businesses will be affected by the disruption of business within the Puget Sound region.

Lives may be at risk from the inhalation of ash or extended flooding due to a massive eruption of Mount Rainier.

Past and Current Mitigation Efforts

Volcanic hazard assessments and plans have been done for Glacier Peak, Mount St. Helens, Mount Rainier, and Mount Baker through federal, state and local agencies.

The city should consider preventative measures for their equipment, and provide public education on volcanic eruption preparation. Public education can be provided through the city's website, via hard copy brochures, and through in-person education classes.

First responders should have access to hazard scenarios in this area to review with their team members at random times throughout the year. This will keep up awareness to such potentials, and will allow for better response should it be required.

Wildland Fire

Scenario A non-contained wildland fire reaches developed areas of Squak Mountain while local fire sources are deployed on other major wildfires.

Low Impact		Moderate Impact	High Impact
Life Safety Issue	yes		
Property Damage	minor moderate major		
% of City Affected	approximately 40%		
Probability	Moderate		
Frequency	Low		

Wildland fires have decreased in acreage burned since preventative measures have been undertaken to prevent and contain smaller fires created by natural events. Forested lands and brush adjacent to populated areas have created more hazards and the potential for loss of life. Recent fires in California and Arizona, as well as the Pacific Northwest, have resulted in deaths.

When wildfires take hold, the amount of property damage can be significant. The 2007 fires in Southern California devastated thousands of homes and loss of property was estimated in the billions of dollars.

Issaquah has the potential for significant loss of property from a large wildland fire.

Background

Although lightning is the major cause of wildland fires in the summer months, human interaction causes many fires, especially as cities encroach on once native forestland through development. As weather patterns change and brush is subjected to extended drought periods and windstorms, Issaquah could also be prone to fires during the summer and fall months.

Issaquah is vulnerable to wildland urban interface fires due to the forestlands that surround much of the city coupled with new residential developments adjacent to urban forestland and the potential for high velocity windstorms. The probability of a major or significant wildland urban interface fire affecting Issaquah is low to moderate, but the impact can be moderate to high in scope.

History of Events

In the summer of 2003, there was a 30-acre wildland fire on the outskirts of the city of Carnation. Although property damage was low, the potential for massive destruction was a reality. Two smaller wildland fires during the same timeframe and in the same area were also noted. Several other small wildland fires in King County, and in lands adjacent to King County, were noted in Washington State Department of Natural Resources reports.¹⁰

California wildfires in October of 2007 reminded residents of the West Coast how quick and devastating wildfires can be. In San Diego County alone, preliminary estimates on the economic impact reached well over one billion dollars (\$1,000,000,000). Several residents were killed due to the fires, and numerous injuries were reported to residents and firefighters. Over 1,800 residential and commercial structures were destroyed.

Hazard Impacts

The Issaquah Highlands and Talus developments encompass high-density residential areas, and some retail properties. These developments are built on lands adjacent to forested areas, and many of the structures in these areas are on steep hillsides where fire can move quickly uphill.

Older developments on Squak and Cougar Mountains are built on steep hillsides, and have many of the same characteristics as the Issaquah Highlands and Talus developments.

Past and Current Mitigation Efforts

- Develop, enact and enforce vegetation management ordinances to reduce the opportunity for wildland fires adjacent to residential, retail and commercial structures as identified by the fire

marshal. This ordinance should be a high priority to protect property and safeguard the public and public safety personnel who respond to the wildfire events.

- Reduce the amount of wood products burned through a reduction in the number of burn days, while encouraging citizens to use wood chippers to recycle wood and brush from their property. Fire and other municipal and county agencies have purchased wood chippers for public use at specific sites throughout the year.¹¹ The air quality is improved, as is the risk of wildfire caused by individual burning.
- Plan hydrant placement and water flow capabilities for wildland urban interface fires to sufficiently handle fires within the forested areas directly adjacent to planned developments. Retrofit developments within forested areas to sufficiently support fire fighting per the city and fire marshal.

Technological Hazards Identified

Abandoned Underground Mines

Scenario An abandoned mine on Squak Mountain collapses, creating a 40' wide sinkhole on Wildwood Boulevard.

Low Impact	Moderate Impact	High Impact
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Life Safety Issue	no (low potential)
Property Damage	minor moderate major
% of City Affected	approximately 1%
Probability	Moderate
Frequency	Moderate

Life safety is rarely at risk in abandoned mines in the Issaquah area. Federal regulations and mine site mitigation have reduced the potential for mine hazards.

Property damage can be impacted by collapsing mineshafts. Although the damage may be minimal, private property, as well as public infrastructure, could be affected.

Background

Issaquah has a coal mining history dating back to the late 1860's, and the mining in the region was active until the 1960's. With this history comes the physical hazard of old and abandoned underground mines. Tiger, Squak, and Cougar Mountains all have abandoned mines within them. It is noted that all the known mines have been sealed as of 1987 by the federal government, but collapses are still probable, causing sinkholes and other issues. Much of the land where mining was

done is now preserved as open space, but it is possible that unmapped mines are still a hazard. The probability of a collapsed underground mine is Moderate, and the impact should be low.

History of Events

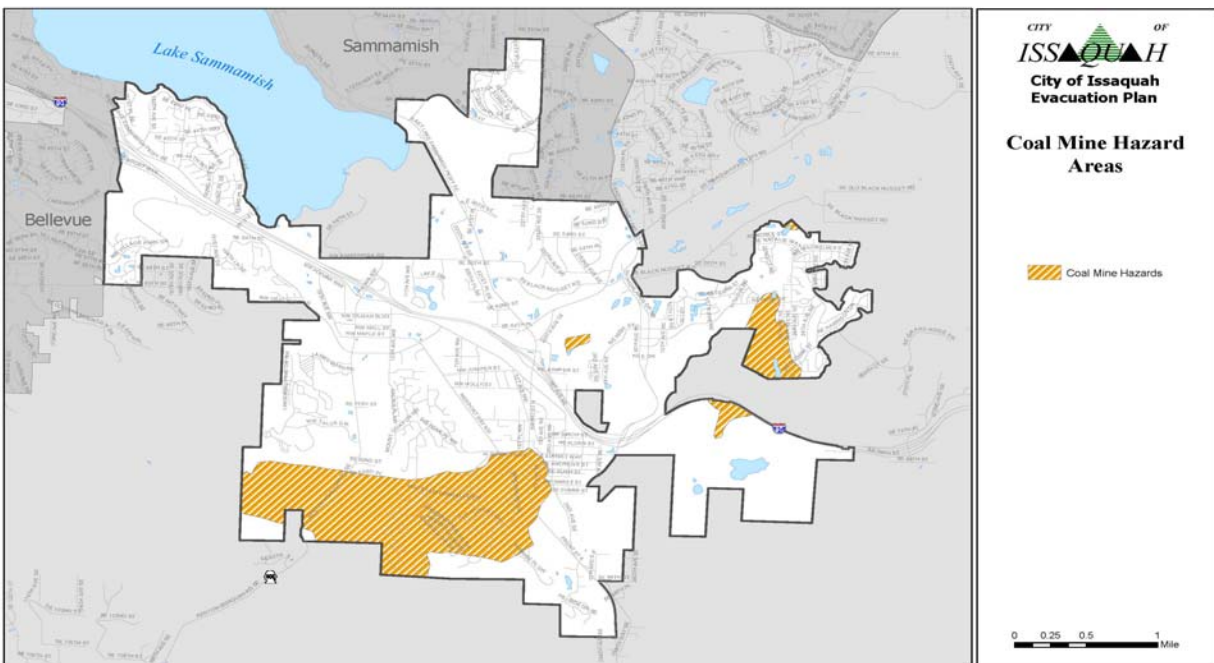
According to the *Washington State Hazard Identification and Vulnerability Assessment*, four (4) persons were overcome by gas (but survived) at an abandoned mine near Issaquah.¹² Other minor mine collapse sinkholes due to timber collapse, earthquakes, and flooding of mineshafts have been noted in Issaquah, most recently on Wildwood Blvd at Sunrise Place in 2005.

Hazard Impacts

As development comes closer to known mining areas in Issaquah, the probability of finding more unmapped abandoned underground mines increases.

Past and Current Mitigation Efforts

Recent developments have surveyed and tracked known mines in the area, and future developments in known and potential mining areas need to pursue this action as well before any building construction is allowed in the city.



Coal Mine Hazard Areas - Map 15

Epidemic

Scenario A Phase 6 pandemic flu outbreak is confirmed by the King County Department of Health in the Seattle Area.

Low Impact	Moderate Impact	High Impact
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Life Safety Issue	yes
Property Damage	no
% of City Affected	100%
Probability	Moderate
Frequency	Moderate

The loss of life due to a pandemic outbreak could reach proportions similar to three major pandemics since 1918. As recent as 2007, professionals have estimated that a nationwide influenza pandemic today could kill over 200,000 persons. 100% of the residents of Issaquah would be affected either through contracting the disease or being isolated in their homes.

Property damage would not be initially affected, but long-term affects could include the destruction of public infrastructure, as responsible individuals are hospitalized or in seclusion at home to prevent the spread of the disease.

Background

According to the King County Department of Public Health, an epidemic is “an outbreak of a disease that occurs in one or several limited areas, like a city, state, or country.”¹³ Once the disease spreads beyond the borders of several countries and affects many countries across the globe, it is called a pandemic. The probability of an epidemic may be low to moderate, but if it reaches Issaquah, the human impact could be extremely high, as well as the devastating cost to the local and national economies. The current pandemic bird flu only has to show it can be spread easily from human to human to reach the critical level where entire communities will be affected.

History of Events

The hazard of epidemics is not new. Other epidemics such as the Influenza of 1918 killed over half a million people just in the United States, and over ten million world- wide.¹⁴ Modern epidemics are very much a hazard that have just been addressed in the last few years. They are so recent that the current Washington State and King County Hazard Identification and Vulnerability Assessment documents don’t list them as hazards.

Hazard Impacts

The entire community, including the city’s workforce, is susceptible to an epidemic. The business community will suffer from a lack of available workforce, and the economic impact will be enormous.

Past and Current Mitigation Efforts

The King County Department of Public Health is the primary contact for information and education for the city of Issaquah in this hazard. Understanding the recent pandemic bird flu hazard is extremely important for local governments, including the six (6) phases of a pandemic. Current public education through the King County Department of Public Health needs to continue at the local level.

Stocking up on personal food and water supplies by community members is important in this hazard, as with preparation for other hazards such as an earthquake. When presenting the public with presentations on emergency preparedness, epidemic preparedness should be discussed.

Cities need to take precautionary steps now to prevent devastating results should the epidemic begin to spread. This includes educating, preparing, and providing plans and protection for city employees.

A plan by the city on how to continue daily operation as well as emergency operation during an epidemic needs to be developed and exercised.

As in other emergencies, RCW 38.52.070 gives cities in Washington State general authority during a pandemic/epidemic.

First responders should have access to hazard scenarios in this area to review with their team members at random times throughout the year. This will keep up awareness to such potentials, and will allow for better response should it be required.

Chemical and Hazardous Materials Spills and Releases

Scenario A major release of a toxic chemical from an Issaquah commercial business or tanker truck on Interstate 90 affects residents and businesses in downtown Issaquah.

Low Impact	Moderate Impact	High Impact
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Life Safety Issue	yes
Property Damage	minor moderate major
% of City Affected	approximately 25%
Probability	High
Frequency	High

Toxic chemical spills and other similar releases into the environment can be potential life safety concerns. Death and serious injury can occur. Several businesses in Issaquah use dangerous chemicals in the manufacture and sale of goods. Vehicles traveling through Issaquah on Interstate 90 carry materials that can potentially cause serious harm to numerous persons.

Property and environmental damage can be serious even if short-term in nature, and it can possibly cause irreparable harm to the fragile environment within the community. The damage to the environment could range from minor to moderate.

Background

Issaquah is not immune from chemical releases, or hazardous material spills. The Darigold dairy product plant on Front Street uses hazardous chemicals in its production process, and it is a potential site for a hazardous materials spill as well as a hazardous chemical release.

There is a high probability of a spill or release in the city, with the potential impact being significant to the community.

History of Events

In King County, there have been several minor chemical spills noted. A recent local example of a chemical spill is the 2002 traffic accident of a fuel tanker on Interstate 90 in Issaquah that spilled thousands of gallons of gasoline fuel on the highway, and the fuel burned on land adjacent to the freeway.¹⁵ The response to the accident involved personnel and resources from the Boeing Company, the Seattle-Tacoma Airport Fire Department, and several local fire departments.

A major propane tanker truck explosion occurred in October 2007 at a foundry site in Tacoma. The damage to the plant was substantial, four (4) individuals received serious injuries, and economic losses were substantial. Freeway and local road traffic was impacted for several hours.

Hazard Impacts

The Darigold plant on Front Street uses hazardous chemicals in its production process, and is a potential site for a hazardous materials spill as well as a hazardous chemical release. Other hazardous materials in the city include vehicle fuels, and propane, among others. Hazardous material and/or chemical releases and spills will enter the air stream, and the aquifer could be contaminated, affecting the water in city wells, and contaminating local streams, affecting humans, fish and wildlife.

Like the October 2007 accident noted in Tacoma, there are several sites in Issaquah where propane is transferred to a tank(s) on site. The hazard is substantial to the community.

Past and Current Mitigation Efforts

A *Spill Contingency Management Plan* (SCMP)¹⁶ was drafted in 2005 by a private contractor to the city after the Interstate 90 tanker incident in 2002. From this document, a *Spill/Incident Response*

Plan for the Lower Issaquah Valley, the Sammamish Plateau, and the Cascade View Zones ¹⁷ has been developed. The *Spill/Incident Response Plan* is Appendix S to the Washington State Wellhead Protection Program.

In response to spills that could affect the aquifer if the city of Issaquah, the Eastside Hazardous Materials Team, headquartered at Bellevue Fire Department Station 6, will respond together with Eastside Fire and the Issaquah Police Department. The Eastside Hazardous Materials Team is contracted by Eastside Fire to handle this type of hazard for the city of Issaquah.

Eastside Fire and the Issaquah Police Department have jurisdiction in these types of incidents in the city, except for incidents on Interstate 90 and SR 900. The Washington State Department of Transportation and the Washington State Patrol have jurisdiction on both of these highways once on scene.

The city and Eastside Fire need annually updated records on plants and other facilities that use hazardous materials and/or chemicals, or store hazardous materials and/or chemicals, for training and planning purposes.

Training in this area needs to be incorporated in annual emergency response training/retraining for first responders as well as others who are responsible for spills and releases of hazardous materials and chemical releases.

First responders should have access to hazard scenarios in this area to review with their team members at random times throughout the year. This will keep up awareness to such potentials, and will allow for better response should it be required.

Pipeline Eruption

Scenario The Williams gas pipeline in the Issaquah Highlands ruptures during a major earthquake, leaking natural gas and making evacuation and emergency response in the Issaquah Highlands impossible. The winds are blowing in a Northeasterly direction into the Issaquah Highlands Development.

	Low Impact	Moderate Impact	High Impact
Life Safety Issue	yes		
Property Damage	minor	moderate	major
% of City Affected	approximately 25%		
Probability	Moderate		
Frequency	Moderate		

Life can be severely affected by the inhalation of natural gas. Ruptured pipelines under high pressure, and even normal household pressure, can be extremely hazardous when gas is released in mass quantity in inhabited areas.

Property damage can range from negligible to major if the gas is ignited and fire spreads throughout inhabited neighborhoods and commercial developments.

Background

There is a twenty-six inch (26") natural gas pipeline, known as the Williams Pipeline, that runs underground through the Issaquah Highlands area, and areas of the Issaquah Plateau that are within the city's Planned Annexation Area (PPA).¹⁸ A smaller diameter pipeline spur is located west off the main pipeline down from the Issaquah Plateau. It runs perpendicular to, and south of, S.E. 56th, terminating just east of East Lake Sammamish Parkway. These pipelines are a major hazard in the event of a major earthquake or landslide. See Hazard 1, "Earthquake/Seiche" and Hazard 3, "Landslide", for more information.

History of Events

Gasoline and natural gas pipeline ruptures are rare, but they have an impact on the communities where they occur. No local ruptures have been documented. There is a low probability of a rupture in Issaquah, but the area where a natural gas pipeline runs through Issaquah is in the impact zone of the Seattle Fault. The impact could be moderate to high, considering the pipeline runs through the densely populated Issaquah Highlands.

Three major pipeline ruptures that occurred in Washington State are included here:¹⁹

- Feb 8, 1999a 26" natural gas pipeline caught fire and exploded near Everson, Washington. The cause was ground movement of water-saturated soil.
- Feb 9, 1999 a natural gas pipeline caught fire and exploded near Kalama, Washington. The cause was a rupture of the pipeline due to ground movement and a break at a welded joint.
- June 10, 1999 A leak in a gasoline pipeline caught fire in a Bellingham, Washington park and killed two (2) young boys and a young man. The leak caused 277,000 gallons of gasoline to run into a creek bed.

Hazard Impacts

The 2,200 acre Issaquah Highlands area could be dramatically impacted by the underground natural gas pipeline in the area by restricted ingress and egress. Both evacuation and emergency response will be affected. This is especially true during the winter months when roadways surfaces may be compromised by icy conditions.

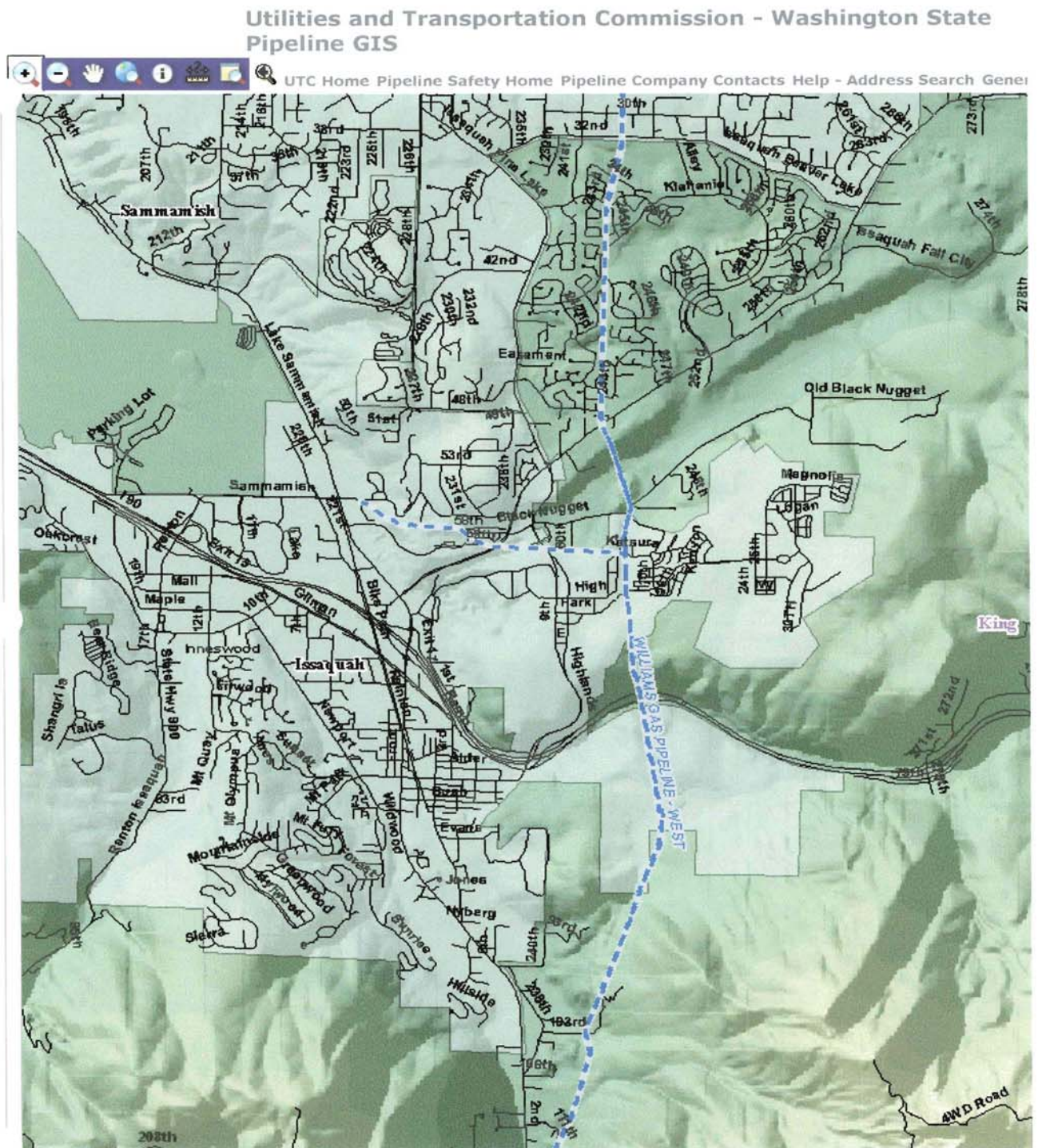
The communities northeast of the current city boundary, (Brookshire and Klahanie) being considered for annexation into the city, would also be impacted by this gas pipeline as well as it runs through

their developments.²⁰ Those areas have more ingress and egress points for residents and emergency personnel, and the terrain is less difficult to negotiate in winter weather.

Past and Current Mitigation Efforts

The city is aware of the potential for this pipeline to rupture, and has contracted studies for the Issaquah Highlands area only. If these and other developments annex to the city, it is critical that any annexation documentation include information on the pipeline in those areas and that mitigation occur for the hazard.

First responders should have access to hazard scenarios in this area to review with their team members at random times throughout the year. This will keep up awareness to such potentials, and will allow for better response should it be required.



<http://www2.utc.wa.gov/pipeline/>

8/19/2008

Power Grid Failure

(Gas and Electric Power, Not Severe Weather Related)

Scenario: A Pacific Northwest regional power grid failure during the summer months knocks out power to Issaquah for an estimated 48-72 hours.

Low Impact	Moderate Impact	High Impact
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Life Safety Issue	yes
Property Damage	minor moderate major
% of City Affected	100%
Probability	Moderate
Frequency	Moderate

As previously noted in this assessment, prolonged power outages in the community can profoundly affect lives. The elderly and frail are especially susceptible to periods of extreme cold or heat. Medical treatment may be limited by alternative short-term power sources.

Property will be affected by mass power grid failure. Perishable foods, medicine and other critical items that depend on refrigeration may be destroyed.

Background

The November and December storms of 2006, and the January and February storms of 2007 in the Puget Sound region caused electrical power outages that put lives at risk, damaged public and private property, and caused commercial product to spoil, not be delivered or destroyed. The effects of a severe storm are noted in this report in Hazard 4, "Severe Storm". Prolonged electrical grid failure due to a severe earthquake or terrorist action has a moderate possibility of occurring, with a moderate impact, as it will not only affect everyone in the communities where the power failure occurs.

Bonneville Power Administration has overhead high voltage power lines running through the Issaquah Highlands development.

Gas line disruption due to an earthquake, landslide, or terrorist action could cause public use to be interrupted for prolonged periods of time. Repairing underground pipelines, including residential pipelines, requires professional service by authorized personnel. In the 1994 Northridge Earthquake in Southern California, major gas lines were ruptured, and getting gas company representatives out to make sure the individual lines in and around homes and businesses were in working condition took weeks to complete.²¹

History of Events

The 2001 Nisqually Earthquake in the Puget Sound area, as well as the 1994 Northridge Earthquake in Southern California, brought the power grid to a halt in many areas. There have been other

incidents where the power grid was severely affected by mechanical issues and minor acts of terrorism.

Mechanical failure of a major power grid system occurred in the northeast section of the United State and Canada in August of 2003, affecting more than 50 million people. Some were without power for more than 14 hours.²²

Hazard Impacts

As previously noted, a power grid failure will affect everyone in the communities where the power failure occurs. This will cause numerous public safety issues, as well as public health issues for many, in particular the infirmed, the very young, and the elderly.

The Bonneville Power Administration overhead high voltage power lines running through the Issaquah Highlands development are of special concern. Should the lines go down in a severe storm, earthquake or other disaster, the upper portion of the Issaquah Highlands will be cut off from the rest of the city. This includes emergency responders who will be unable to reach the residents of the area until the lines are deactivated or repositioned due to their location and the high voltage running through them. Primary and secondary ingress and egress routes are impassable in this scenario.

Past and Current Mitigation Efforts

The city has improved its response to emergencies such as a power grid failure by updating its Emergency Operations Center, Emergency Operations Plan and partnership with other government agencies in King County, Region 1.

The city has implemented the following to mitigate the effects of power grid failures as well as other hazards in the community:

- Hire an Emergency Management Coordinator to work with the Emergency Management Director in directing preparedness and coordinating efforts before, during and after major emergency incidents
- Purchase emergency generators for the city's Community Center and Senior Center to provide fully operational emergency shelters
- Purchase and install an emergency AM radio system to notify all city residents of the city's response to the activation of local emergency shelters
- Implement a Reverse 911 system to notify residents of impending danger
- Hire an Information Officer to coordinate and facilitate emergency information

First responders should have access to hazard scenarios in this area to review with their team members at random times throughout the year. This will keep up awareness to such potentials, and will allow for better response should it be required.

Terrorism

Scenario Several persons enter the area of Issaquah High School, Tiger Mountain Community High School, and Clark Elementary School armed with rifles and bomb materials, threatening the lives of students and faculty.

Low Impact	Moderate Impact	High Impact
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Life Safety Issue	yes
Property Damage	minor moderate major
% of City Affected	approximately 10%
Probability	Low
Frequency	Moderate

Unfortunately, Issaquah is not exempt from acts of violence from individuals outside of the school campus. Bomb threats have been made at the high school campuses as recently as December 2007. Throughout the nation, incidents of firearm violence by unstable individuals are noted. Life safety plans and response to campus violence, such as described in this scenario, need to be in place and exercised by public safety and education professionals.

Property damage may be minor, but the threat against the lives of others is real.

Background

Terrorism is defined by the Federal Bureau of Investigation as “the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population or any segment of it in furtherance of political or social objectives.” ²³

In terms of the city of Issaquah being a specific target of major terrorism, the risk is low, but with a moderate impact to the community and business sector.

History of Events

The Puget Sound region has experienced terrorism for many years, including the bombing of banks, research facilities such as the University of Washington in 2001, and military training centers and schools such as ROTC facilities. Since September 11, 2001, terrorism has become a critical aspect of our lives, and continues to be today.

Eco-terrorism has roots in the Pacific Northwest, and Seattle and Sammamish have both experienced eco-terrorism. In 2005, persons who identified themselves as involved in the Earth Liberation Front set two homes under construction in Sammamish on fire.

Hazard Impacts

The Puget Sound region may be even more of a target for both terrorism and cyber-terrorism due to numerous software companies and related industries headquartered in the region.

With Costco based in Issaquah, and if Microsoft Corporation develops a second campus in the city, the potential for cyber-terrorism on local business could increase to moderate probability and risk. With this comes the potential for city computer systems to be a target as well.

Past and Current Mitigation Efforts

The Issaquah Police Department is involved with the Department of Homeland Security in receiving critical information, as well as giving information to the correct agencies, to fight terrorism. Training and retraining in this area on a regular and consistent basis needs to continue, and appropriate public education should be provided as necessary. Budget consideration should receive the high priority to ensure the best actions are taken to protect the community.

The Emergency Management Group needs to communicate with the Police Department and visa versa, to ensure accurate communication takes place regarding threats and mitigation efforts for the community, especially in the area of emergency notification via Reverse 911 and a public announcement radio system.

Cyber-terrorism

Scenario A known radical group performs acts of terrorism in the Pacific Northwest, targeting computer related businesses and other large business operations with malicious code affecting commerce and life safety in Issaquah.

Low Impact	Moderate Impact	High Impact
------------	-----------------	-------------

Life Safety Issue	yes
Property Damage	minor moderate major
% of City Affected	approximately 100%
Probability	Moderate
Frequency	Moderate

The loss of life in cyber-terrorism events is a remote possibility. The use of information technology to produce the fear of violence is becoming more viable every day. From threats against energy producing corporations to high-tech related business, communities need to prevent and exercise plans

to mitigate the hazard. The Pacific Northwest, including Issaquah, has numerous businesses that are potential targets for this type of attack.

Cyber-terrorism may impact property damage more than loss of life. Information on information technology systems that is destroyed can affect millions of individuals for many years if not forever. The financial loss to local business and corporations, as well as regional and worldwide businesses, could range from millions of dollars to trillions of dollars.

Background

Cyber-terrorism is defined as “the attack on computer systems, networks and the information stored on these devices.”²⁴ It can be accomplished in both public and private entities.

The city of Issaquah, its citizens, and its businesses are all susceptible to cyber-terrorism. In terms of the city of Issaquah being a specific target of cyber-terrorism, the risk is low, but with a moderate impact to the community and business sector.

History of Events

In 2003, the city of Seattle’s computer systems were compromised due to a computer virus that affected computers. This same year, the Seattle Police Department’s computer-aided dispatch system became inoperable for hours, as did some bank ATM systems due to cyber-terrorism.²⁵

Worldwide, computer systems have been compromised since computer systems began to be infiltrated by hackers and others intent on disrupting the public as well as private business and government agencies. The threat continues today.

Hazard Impacts

The Puget Sound region may be even more of a target for both terrorism and cyber-terrorism due to numerous software companies and related industries headquartered in the region.

With Costco based in Issaquah, and if Microsoft Corporation develops a second campus in the city, the potential for cyber-terrorism on local business could increase to moderate probability and risk with a potentially high impact. With this comes the potential for city computer systems to be a target as well.

Past and Current Mitigation Efforts

Private business has developed organizations to discuss and mitigate against cyber-terrorism. The city needs to take action to protect their computer systems and focus on ensuring their emergency management computer systems are secure through the best technology available. Information technology resources need to stay vigilant for city resource vulnerability, and educate employees on procedures to reduce the risk.

The city also needs to partner with business to help identify risks to the private sector and mitigate issues where possible.

Transportation

Scenario A commercial air carrier leaving SeaTac Airport has experienced mechanical failure, ultimately crash landing in a high-density residential neighborhood.

Low Impact	Moderate Impact	High Impact
------------	-----------------	-------------

Life Safety Issue	yes
Property Damage	minor moderate major
% of City Affected	less than 50%
Probability	Low
Frequency	Moderate

Lives of passengers, flight crew, and community members lost can number into the hundreds in one air disaster over the community. Family members left behind are devastated by the loss of loved ones and friends. Emergency response workers are impacted for a lifetime. Issaquah is in a flight path for both SeaTac Airport and Boeing Field, which handle large commercial aircraft.

Property affected by an air disaster includes not only the aircraft involved, but also the private land, highways, residences, businesses, and public lands. Devastation can total many millions of dollars and beyond.

Background

The city of Issaquah is intersected by Interstate 90, the most used east-west corridor in the state. It is used by thousands of cars, trucks and motorcycles every day, with 5 hours of heavy congestion every workday per the Washington State Department of Transportation.²⁶ In addition to this major highway, the city has many miles of streets and alleys used by commuters and residents. The potential for a major incident, especially along Interstate 90, is ever-present, and the probability of a major disaster is moderate, as is the potential for impact to the community.

History of Events

Per the Washington State Department of Transportation in the *I-90 Bellevue to North Bend Corridor Study*, congestion on Interstate 90 spans three hours during the morning commute and two hours during the evening commute.²⁷ Traffic over the last decade has escalated 95% west of the Sunset Interchange in Issaquah, and more than 26% between Bellevue and Issaquah.

Hazard Impacts

Vehicular Traffic on the Interstate 90 corridor: This major east-west interstate highway runs through the Interstate 90 Corridor in the middle of the city. More than 7,000 trucks travel through Issaquah daily, including travel on Interstate 90.²⁸ Commercial vehicles carrying hazardous materials, as well as other loads of explosive materials, traverse the city on a daily basis.

Air Transportation: Issaquah is traversed by commercial and private aircraft numerous times, day and night. An air disaster is a possibility as there are numerous aircraft above Issaquah going to and from Boeing Field and Seattle-Tacoma International Airport.

Marine Transportation: Private boats on Lake Sammamish are subject to accidents, leaking of fuel/oil products, etc. Boating accidents during sanctioned boating events increase the probability of emergency response to maritime accidents.

Rail Accidents: Rail transportation is currently non-existent in Issaquah.

State Highways: SR-900 is the only Washington State highway in Issaquah. Traffic exiting Interstate 90 onto SR-900 into the city limits has increased due to increased residential traffic from the Talus development off this roadway. The probability of increased emergency response to traffic collisions on this roadway is moderate.

Local Roads: Local roads are more congested from an increased population due largely to the two master-planned developments in the city and increased commercial development.

Past and Current Mitigation Efforts

The city of Issaquah has been working on traffic studies, capital improvement projects and assessment of impact fees for new developments to mitigate traffic issues in the city.²⁹

The Issaquah Highlands Park and Ride on Highlands Drive has helped with traffic congestion due to improved bus transportation from the site, and has allowed commuters to car pool from the site. The improved, under construction Issaquah Park and Ride on SR 900, will have expanded car parking for bus riders and car poolers, and should help reduce vehicles on the roadway in this area.

In addition to vehicular traffic, the potential for transportation accidents from air and marine vessels is possible, and the city and community should prepare for them. Having current emergency action plans for these disasters is important, as is exercising plans for these hazards.

First responders should have access to hazard scenarios in this area to review with their team members at random times throughout the year. This will keep up awareness to such potentials, and will allow for better response should it be required.

Urban Fire

Scenario A structure fire in the Issaquah Highlands Development starts during a summertime high-wind period, completely blocking Park Drive, and making response difficult.

Low Impact	Moderate Impact	High Impact
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Life Safety Issue	yes
Property Damage	minor moderate major
% of City Affected	approximately 40%
Probability	Moderate
Frequency	High

Fires in urban environments have been reduced by proactive prevention measures, but these fires are still subject to taking human lives and leaving many others seriously injured. Proper mitigation efforts in building design and updates of current structures, coupled with proper staffing of profession fire fighters who are well-trained and equipped, lessens the potential for loss of life.

Property damage from fire can be substantial. Not only are those directly involved in a fire incident, such as the homeowner or business owner, but also those who live or work near the scene of the fire. Enforcing regulations with everyone protects everyone in the community.

Background

The potential for fire in an urban setting is increased with added population and development. Although mitigation can reduce the risk, the probability and impact of fire in the city is moderate, and it is a critical hazard for the consideration of public safety and the entire city staff.

History of Events

The city of Issaquah has been fortunate to have had limited exposure to major fire incidents. Other communities, such as Seattle, Tacoma and Bellevue have had major fire incidents. In particular, two major fires in Seattle, the Blackstock Lumber Yard fire in 1989 and the Mary Pang Warehouse Fire in 1995, killed a total of five (5) firefighters and caused a tremendous amount of property damage. Arson continues to be a major concern in urban firefighting. Similar incidents are possible here, and need to be addressed.³⁰

Hazard Impacts

Although the city of Issaquah has had a low probability of major structure fires, the following factors need to be taken into consideration for hazard identification in urban fire prevention and response:

- the increase in the community's overall population
- the added master planned developments in the community
- the location of these master planned developments (adjacent to forestland, in high wind areas,

in areas of steep roads, and with limited ingress and egress) and the addition of high rise commercial and residential structures

Past and Current Mitigation Efforts

The City has enacted strong fire prevention ordinances to include residential fire extinguishing systems in high-density development structures and larger residential homes.

Currently, all development has fire service review to ensure the highest safeguards against systems that would significantly increase fire risk. This needs to stay in place. The fire marshal service, provided by Eastside Fire, is a critical component to fire protection through prevention and inspection.

- Training and retraining on an annual basis for other first responders in urban fire response such as the Police Department officers, should be a high priority in the budget process. In addition to training, purchasing of personal protective gear such as smoke inhalation masks needs to be considered as soon as possible for the first responders.
- Training fire department personnel and law enforcement first responders to recognize the potential for arson on fire scenes, and work closely with fire service personnel to preserve potential evidence, should be considered.

Hazard Rating Summary Matrix

Rating Index	Earthquake/ Seiche	Flooding	Landslide	Severe Weather	Volcano	Wildland Fire	Mines	Epidemic	Chemical	Pipeline	Power Grid	Terrorism	Cyber-Terrorism	Transportation	Urban Fire
Community Impact	H	M	L	M	H	H	L	H	M	H	M	M	H	M	M
Occurrence Probability	H	H	M	H	H	M	M	M	H	L	M	L	M	M	M
Occurrence Frequency	L	H	H	H	L	L	M	M	H	M	M	M	M	M	H
Overall Hazard Score	7	8	6	8	7	6	5	7	8	6	6	5	7	6	7
Overall Hazard Rating	M	H	L	H	M	L	L	M	H	L	L	L	M	L	M

The Hazard Rating Summary Matrix considers the impact, probability and frequency of each identified hazard and assigns a value of one for low, two for moderate and three for high in each of the three rating categories. The overall hazard score is a summation of the category scores by hazard. Hazards with a score of eight or greater are considered to have a high hazard rating, hazards with a score of seven are considered to have a moderate hazard rating and hazards with a score of six or less are considered to have a low hazard rating.

Critical Facility Hazard Vulnerability

Facility	Earthquake/ Seiche	Flooding	Landslide	Severe Weather	Volcano	Wildland Fire	Mines	Epidemic	Chemical	Pipeline	Power Grid	Terrorism	CyberTerrorism	Transportation	Urban Fire
City Hall NW	X			X	X			X	X		X		X		X
City Hall/ Police Station/ Jail/ 911 Center	X			X	X			X			X		X		X
City Maintenance Facilities	X				X			X	X				X		X
Fire Station #71	X				X			X							X
Fire Station #72	X			X	X			X			X				X
Fire Station #73	X				X			X							X
Four water supply wells.	X	X			X							X			X
Eleven booster pump stations.	X		X		X	X									X
Seventeen reservoirs	X		X		X	X						X			
Three sewer pump stations.	X	X			X										X
Community Center Senior Center	X			X	X			X							X

Declared Disaster Events Effecting Issaquah

Event	Occurrences since 1990	Year of occurrence	\$ loss	Comments
Major floods	3	1990, 1996, 2006, 2009	\$1,151,261	FEMA #852, 853, 1100, 1671, 1734, 1817. Debris removal, Protective measures, building and bridge damage.
Winter storm	2	1997, 2004, 2008	\$927,997	FEMA #1159, 1825 Debris removal, protective measures, structure damage.
High winds	2	1993, 2003, 2006	\$155,518	FEMA #981,1682 Debris removal
Earthquake	1	2001	\$1,057,364	FEMA #1361 Building damage, water tank damage.
Slides	3	1990, 1992, 1996	\$315,400	FEMA #852 Roads, home and utilities damaged.

MITIGATION STRATEGY

Mission

The mission of the plan is to promote sound public policy and practices designed to protect citizens, critical facilities, infrastructure, private property, the environment and delicate ecosystems from natural hazards. This can be accomplished by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities. The plan serves as a guide toward building safer more resilient communities.

Goals

CONSISTENCY WITH REGIONAL GOALS AND OBJECTIVES

There are 6 identified/adopted Regional Hazard Mitigation Plan goals contained within the King County plan:

- 1) Protect Life and Property
- 2) Support Emergency Services,
- 3) Increase Public Awareness (Public Education),
- 4) Preserve Natural Systems and Resources,
- 5) Encourage partnerships,
- 6) Enhance Planning Activities

The City of Issaquah's goals, which remain consistent with the regional goals and objectives, are:

- 1) Protect Life and Property
- 2) Support Emergency Services,
- 3) Increase Public Awareness (Public Education),
- 4) Preserve Natural Systems and Resources,
- 5) Encourage partnerships,
- 6) Enhance Planning Activities

Mitigation Action Items

Mitigation initiatives are the central piece in the City of Issaquah's Hazard Mitigation Plan. It is through the implementation of these initiatives that the City will become more disaster resistant. For the purpose of this document, mitigation initiatives are defined as activities designed to reduce or eliminate losses resulting from natural hazards. The projects and initiatives will be incorporated into the regular business planning of the City. These include Capital Improvement Project Planning and budget recommendations, annual operation's budgets, education programs and periodic City code reviews.

In addition to specific mitigation action items listed in this plan, mitigation measures for each hazard identified are addressed through the plans, codes and ordinances shown in the planning capabilities matrix.

Recognizing that all mitigation projects must pass a full benefit/cost analysis prior to consideration for funding, the mitigation strategies identified by the City of Issaquah were reviewed for benefit cost ratio and only those initiatives with a benefit cost ratio greater than one are included in this plan. Values used in the benefit cost review process were based on historic losses, replacement values and or the value of a life saved (based on \$2.3 million discussions from World Trade Center collapse). Priority scores shown on initiative forms are shown for reference only as actual community priorities are established annually by the Issaquah City Council based on input from the Issaquah community, Issaquah City Council goals and funding availability. Since Issaquah operates water, sewer and storm water utilities each with its own funding source in addition to general government functions, the City prioritizes projects within each fund rather than on an aggregate basis. Where more than one initiative per funding source is listed in this plan the priority shown reflects the priority order within the funds Capital Improvement Plan as currently established by the Issaquah City Council.

2004 Mitigation Action Item Update

Status of Projects included in the 2004 hazard mitigation plan:

- City Hall NW Non-Structural Retrofits – Complete
- Tributary 0170 Flood Reduction Improvements – Complete
- Flood Plain Mapping – Complete
- Water System Seismic retrofits – Forest Rim and Cougar Ridge reservoirs replaced with seismically sound reservoirs.

- Highwood Reservoir Seismic Retrofit – Not completed (deferred for Forest Rim and Cougar Ridge replacements and included in current seismic retrofit program).

Mitigation Action Item Matrix - 2009

Action Item Number	Goal	Action	Priority by Fund	Funding Source	Responsible Department	Status
1	1) Protect Life and Property	Water system seismic retrofits	1	Water Fund, Grants	Public Works Engineering	Included in Capital Improvement Plan and proposed budget for 2010-2012
2	1) Protect Life and Property	Mt Hood Pump Station seismic re-build.	2	Water Fund, Grants	Public Works Engineering	Included in Capital Improvement Plan for 2014
3	1) Protect Life and Property 2) Support Emergency Services,	Flood warning gauge on Issaquah Creek north of Fifteen Mile Creek	1	Storm Water Fund, Grants	Public Works Operations	Included in Capital Improvement Plan and budget proposal for 2010
4	1) Protect Life and Property 2) Support Emergency Services,	Flood hazard repetitive loss mitigation	2	Storm Water Fund, Grants	Public Works Engineering	Included in Capital Improvement Plan and proposed budget for 2010
5	1) Protect Life and Property 2) Support Emergency Services 3) Public Education	Promote CERT and Map Your Neighborhood (MYN) programs	1	General fund, Grants	Emergency Management	New Project

Initiatives are listed in order of priority by funding source.

Mitigation Action Item Narratives:

Water System Seismic Retrofits:

Retrofitting and repair of reservoirs, pump stations, pressure reducing stations, and well facilities to improve their ability to be operational following a large seismic event. The facility and type of

improvements necessary are discussed in the EQE Report dated December 1997 and titled "Seismic Vulnerability Assessment of the City Of Issaquah Water/Wastewater Systems", and field observations of earthquake damage. Also Plan to retrofit the Highwood reservoirs with anchor bolts and other strengthening measures. A report prepared by a consultant identified certain facilities that are susceptible to damage during a large earthquake which should be retrofitted for better seismic performance. Retrofitting increases the chances of facilities being operational, may reduce emergency response to events, and will improve the reliability of the system following an earthquake. This project has a benefit cost ratio of 9.2:1 based on structure retrofit costs and loss of life potential.

Mt Hood Pump Station Seismic Re-build:

Mount Hood Pump Station is a cinder block building constructed in 1977 which houses 2 - 450 gpm pumps lifting water about 190 feet. The Seismic hazard evaluation study concluded that the building has vulnerability and is the only station moving water up to the Wildwood Reservoir. Should the station be damaged the upper Squak mountain area would be without water. The pump station should be replaced with a new earthquake resistant concrete building and corresponding equipment. This project has a benefit cost ratio of 2.8:1 based on replacement cost and loss of life potential from failure.

Flood Warning Gauge:

Existing stream gauging on Issaquah Creek does not intercept Fifteen Mile Creek prior to the southern City boundary. Installing an additional creek gauge below Fifteen Mile Creek would provide more accurate flow data and flood warning for the City of Issaquah reducing potential flood losses. This project has a benefit cost ratio of 69.7:1 based on loss of life potential.

Flood Hazard Repetitive Loss Program:

In response to the January 2009 flood, the City applied for a FEMA Hazard Mitigation Grant that would provide funds for structure elevations to raise homes above flood levels which greatly reduces flood damages. Approximately 6-8 single family houses are identified for elevations. Notification of grant award, including amount of qualifying grant assistance, will be in early 2010. Funding under this project will cover staff time to process the grant and assist residents and business owners only. The City's flood hazard management strategy calls for elevating or flood-proofing structures that have repetitive losses from flooding as the most cost effective means for reducing flood damages. Purchase of severely flood-prone properties is needed where redevelopment within high flood hazard areas is deemed inappropriate. The FEMA grant provides funding of 75% for these activities, and the State may contribute an additional 12.5%. Local property owners will be responsible for the local share (12.5%-25%, depending on State contribution, if any). This project has a benefit cost ratio of 3:1 based on future avoided losses.

CERT and MYN Program:

Work with Issaquah Citizen Corps and other private and non-profit organizations to promote CERT and Map Your Neighborhood (MYN) programs throughout the City of Issaquah. During an emergency or disaster event City of Issaquah resources will be quickly overwhelmed. Citizens

prepared for disasters require less resources to care for and may also be partners in the response and recovery efforts.

National Flood Insurance Program

Data and Floodplain Inventory

The FEMA floodplain (100-year) defines the Area of Special Flood Hazard, which is regulated under city code.

Inventory of buildings in the flood plain (all building types) with approximate value (potential loss) Structures and Potential Flood Loss in 100-Year Floodplain (From floodplain GIS map and assessor's data)

Type	Number of Structures	Assessed value of improvements
SF Residential	104	\$17,800,000
Multi family	20	\$19,900,000
Commercial	29	\$29,600,000
Total	153	\$67,300,000
Potential flood loss (25% of value of improvements):		\$17 million

Policies And Losses

A reasonable estimate of potential flood loss during a 100-year flood is that structural damage and loss of contents is equivalent to approximately 25% of the assessed value of the structure. This is based on FEMA depth-damage curves for flood loss and assumes that, on average throughout the floodplain, the depth of flooding is 1-2 feet above the first floor. Flood depths in the City are relatively shallow given that the valley is flat, the stream channel is stable, and flooding is typically limited to a short distance (1-2 blocks) away from the stream channel. In fact, most flood losses occur in older areas of Issaquah that were developed prior to adoption of flood hazard regulations, resulting in structures that were not elevated for flood protection purposes. Based on these assumptions, and using assessed improvement values from the King County Assessors office, the approximate potential loss during a 100-year flood is in the order of \$17 million. Historically, floods of approximately 25-year interval have resulted in a \$3-4 million loss (e.g., the 1996 flood), and floods of less than the 10-year event result in relatively few and minor flood insurance claims.

Adoption

The City adopted Ordinance 1465 on February 17, 1981. This ordinance enacted the local regulatory requirements that allowed the city to participate in the National Flood Insurance Program and referenced the May 1, 1980 Flood Insurance Rate Maps as the effective regulatory maps. FEMA community assistance visits confirm the City's eligibility in the NFIP by verifying the flood hazard ordinance meets the minimum required building standards required by FEMA.

Code Enforcement

Issaquah Municipal Code Chapter 16.36 identifies requirements for construction in areas of special flood hazard, as required by the city's participation in the NFIP and the FEMA Community Rating

System (Class 5). These codes are enforced through the Flood Hazard Permit, which is administered by the Public Works Engineering Department and enforced through code enforcement authority contained in Issaquah Municipal Code Chapter 1.36.

The City of Issaquah conducts many flood hazard management activities that provide assistance to the community and monitoring/mitigation of flood hazards:

- The City participates in the FEMA Community Rating System (CRS) under a Class 5 rating. This CRS is a voluntary FEMA program that reduces National Flood Insurance Program (NFIP) flood insurance premiums for local policy holders if the City implements certain flood hazard management activities. This achievement supplements the City's continual efforts in reducing flood hazards through effective building and floodplain management standards and other activities (described below).
- The City implements capital improvement projects and maintenance on an annual basis to reduce flood hazards. This includes applying for FEMA flood hazard mitigation grants to help homeowners to elevate their homes.
- The City conducts annual public outreach activities to inform property owners in the floodplain of their flood risks, and actions that should be taken in case of flood. An 8-page brochure is hand-delivered to homes and businesses.
- A flood warning system is operated to notify residents of impending severe flood conditions. A variety of mechanisms are used to broadcast the warning, including telephone, cable TV, press releases to local media, city web site, and email. Flood warning improves public safety and reduces property damage during flooding events by allowing citizens and business owners to take action before flooding occurs.
- The City offers sand bag delivery during floods to help property owners protect their homes.
- The City monitors flooding conditions when the flood warning system is activated. Public Works Operations personnel continually monitor rising water levels from telemetered stream gauges located in the City and also upstream, and keep an eye on critical flood locations such as low-lying neighborhoods and streets. City staff also assesses post-flood conditions to determine whether damage repairs or capital improvement projects are needed to mitigate future flooding.
- The City responds to public inquiries and provides technical assistance to its citizens and business owners. This is an essential service because the City acts as the intermediary between FEMA's National Flood Insurance Program and city residents. Assistance is provided on NFIP questions such as how to obtain elevation certificates, grandfathering rules for older structures, and insurance requirements for people seeking to purchase homes in the floodplain. Other technical assistance is provided on mitigating flood hazards, such as how to floodproof their structure or deal with an eroding stream bank.
- The City regularly maintains the Flood Insurance Rate Maps by through FEMA Letters of Map Revisions, to address mapping errors and reflect floodplain improvements such as bridge replacements and flood conveyance improvement projects.

Recent Activities

The most significant event that occurred in 2009 was the January flood that caused flooding similar to the February 1996 flood event, which previously was the most damaging flood in the City's history. Following this event, FEMA announced a Hazard Mitigation Grant Program to provide

funds for flood mitigation projects. An application for \$1.5 million in funding was submitted in September, 2009. This grant proposes to elevate up to five single family homes and also floodproof the Gilman Square buildings. Status of grant award will be in early 2010.³¹

Current CRS Rating

The City is approved at a CRS Class 5 rating, the previous classification. (The CRS rating goes from Class 10, the lowest level of participation, to Class 1, the highest). Of the 30 cities and counties in Washington that participate in the CRS, one-third have Class 5 rating or better. This class provides a 25% discount to flood insurance premiums. This achievement supplements the City's continual efforts in reducing flood hazards through effective building and floodplain management standards, capital improvement projects and maintenance, and public outreach and flood warning to improve public safety and reduce property damage during flooding events.

Basin Planning

The Issaquah Creek Basin and Nonpoint Action Plan, adopted by both the City of Issaquah and King County Councils in 1995 and approved by the Washington Department of Ecology in 1996, recommends several actions to address flooding and fish habitat problems in the basin. The basin plan serves as the repetitive loss plan for the City of Issaquah. Major recommendations in the basin plan include reducing flood hazards by removing homes from the stream corridor, acquiring or obtaining easements on undeveloped property, and restoring channel and floodplain capacity. The City's 2002 Stormwater Management Plan reiterates these recommendations and provides a guide for planning, funding and implementing a comprehensive flood hazard management program. In January, 2007, King County adopted the 2006 King County Flood Hazard Management Plan. State law governing the preparation of comprehensive flood control management plans (RCW 86.12.210) requires these plans to be binding on each jurisdiction and special district that is located within an area included in the plan.

Current Flood Insurance Policies

As of mid-2009 there were 219 active NFIP policies in the City, with a total annual premium of \$167,755 for coverage of \$51,992,600. These policies cover buildings and contents for owner-occupied properties and building contents for rentals. Total payment by FEMA during the period 1978-2009 was approximately \$3.8 million.

Nationally, the NFIP has paid \$31.4 billion for flood insurance claims and related costs between 1978 and 2006 (\$16 billion was in 2005 alone). Over 5 million people currently hold flood insurance policies in more than 20,200 communities across the U.S.

Repetitive Loss Properties

Repetitive loss properties are defined by FEMA as properties that had two or more flood insurance claims of at least \$1,000 within any 10-year period since 1978. The current repetitive loss list for Issaquah is summarized in Table 1. Properties are eliminated from the RL list only if the properties are fully mitigated (i.e., structure is brought up to current flood code, or the structure is removed).

Historic flood damage claims are summarized in Table 1. It is noted that FEMA does not pay for property or landscaping damages and not all buildings subject to flooding (including City-owned

buildings) are insured by FEMA. Therefore, actual historic flood damage costs in the City are likely higher.

There are 22 total repetitive loss properties in Issaquah, of which 19 currently have structures (three were previously purchased by the City and the houses demolished). For the period 1980-1999, total claims from repetitive loss properties amounted to \$1,959,000, or 92% of all FEMA flood insurance claims in Issaquah. (Nationally, repetitive loss properties represent less than 2% of the insured properties but account for 33% of the insurance claims paid since 1978). Thus, a relatively few number of properties account for nearly all of the FEMA flood damage claims in the City.

Table 1. Flooding Repetitive Loss Properties in Issaquah as of 2008 (2009 data is unavailable)

Address and Owner	Still Subject to Flooding?	Loss Dates	Actions to Reduce Flooding (implemented actions in bold)
SW Newport Way	No	11/23/86, 1/24/84, 1/23/82, 12/15/79	Purchased by City and houses removed in 1994
NW Dogwood Street	No	11/21/90, 1/9/90	Purchased by City and house removed in 2001
NW Birch Place	No	2/8/96, 11/24/90, 1/9/90	Purchased by City and house removed in 1998.
NW Birch Place	Yes	2/8/96, 11/29/95	Will benefit from future Dogwood Bridge replacement.
NW Holly	Yes	11/24/90, 1/9/90	Benefited from Juniper Bridge replacement in 2005
NW Holly	Yes	2/8/96, 1/9/90	Building elevated in 1991. Benefited from Juniper Bridge replacement in 2005
Front Street South	Yes	2/9/96, 11/24/86, 1/24/84	Target of floodproofing program
Front Street South	Yes	2/9/96, 1/9/90	Target of floodproofing program
Newport Way SW (Maplewood Apts)	Yes	11/23/90, 11/9/90, 1/9/90 11/24/86, 12/15/79	Structure has limited potential for additional floodproofing.
Newport Way SW (Parkshore Apts)	Yes	2/7/96, 11/25/90, 1/9/90	Target of floodproofing program.
West Sunset Hwy	Yes	11/24/86, 1/11/86	Benefited from Sunset Bridge replacement in 1997
Sycamore Drive	Yes	11/24/90, 1/10/90, 11/23/90	Target of floodproofing program (2009 FEMA grant application)
SE Sycamore Lane	Yes	11/6/06 , 2/8/96, 11/25/90, 1/9/90, 11/23/86	Target of floodproofing program (2009 FEMA grant application)
SE Sycamore Place	Yes	2/7/96, 11/24/90, 1/9/90, 11/23/86	Target of floodproofing program (2009 FEMA grant application)
SE Sycamore Place	Yes	11/24/86, 1/25/84	Building was raised after 1990 flood. Target of floodproofing program.
SE Sycamore Lane	Yes	2/8/96, 11/24/90, 1/9/90	Target of floodproofing program.
5 th Ave NW	No	1/9/90, 11/23/86	Building was raised in 2008.
NW Gilman Blvd.	Yes	2/8/96, 11/23/90, 1/10/90	Target of floodproofing program (2009 FEMA grant application)

Address and Owner	Still Subject to Flooding?	Loss Dates	Actions to Reduce Flooding (implemented actions in bold)
W. Gilman Blvd.	Yes	11/24/90, 1/8/90	
NW Gilman Blvd	Yes	2/8/96, 11/24/90	Target of floodproofing program (2009 FEMA grant application)
SE 61 st Street	Yes	2/8/96, 11/22/90, 1/9/90, 11/24/86	Site proposed for redevelopment or purchase for open space
SE 61 st Street	Yes	2/8/96, 11/21/90, 1/9/90, 11/23/86	Site proposed for redevelopment or purchase for open space

Commercial properties in the Gilman Square area accounted for about 40% of the historical flood insurance claims. While this area received significantly improved flood protection from the 1997 Gilman Reach Channel Improvement Project, the January 2009 flood caused significant damage (similar to 1996). Two single-family residences accounted for another 29% of historical flood insurance claims. One of these houses was purchased by the City in 1997 and removed, and the other was improved after the 1996 flood and would be targeted for future acquisition only if a future flood causes significant damage. The Sycamore neighborhood has five residential properties subject to frequent flooding. Many of these properties were included in a FEMA Hazard Mitigation Grant Program application that was submitted in September, 2009.

Acquisition Of Property And Removal Of Flood-Prone Structures

The City uses money from the Stormwater Fund and pursues grant opportunities to purchase developed and undeveloped residential property. Properties acquired through this program are retained as permanent open space and most are restored to improve natural habitat and flood conveyance. Repetitive loss properties are also identified for acquisition as part of the City's flood mitigation program. The acquisition program also supports the habitat restoration program for Issaquah Creek, which supports Chinook salmon, a listed species under the Endangered Species Act. Several properties have been purchased using City funds. Table 2 below provides a summary of past acquisitions.

Table 2. Summary of Floodplain Acquisitions

Year	Name and Location	Repetitive Loss Property?	Status
1993-2009	Issaquah Creek Confluence Park	No	Underdeveloped multifamily-zoned properties (13.2 acres) at confluence of Issaquah Creek and E Fork Issaquah Creek acquired for open space
1994	Dodge 75 SW Clark Street	Yes	Purchase of house with removal in 1994. Property restored for habitat and flood conveyance improvements in 1999.
1994	Harvey 85 SW Clark Street	Yes	Purchase of house with removal in 1994. Property restored for habitat and flood conveyance improvements in 1999.

Repetitive Loss Property?			
Year	Name and Location	Property?	Status
1997	Hanson 300 NW Birch Place	Yes	Purchase of house with removal in 1998. Site restored in Fall 1998.
1997	Sycamore lots Sycamore Creek LN	No	Purchase of nine undeveloped residential lots in floodplain and maintained as open space. Habitat improvements constructed in 2004 and 2007.
1998	Reudink 200 NW Dogwood St.	Yes	Purchase of house with removal in 2001. Property restored for habitat and flood conveyance improvements in 2004.
2000	Darst 180 NW Cherry Place	Yes	Purchase of house with removal in 2001. Property restored for habitat and flood conveyance improvements in 2004.
2006	Berntsen Park 810 4 th Ave.	No	Multi-family zoned property (2.08 acres) along Issaquah Creek acquired for open space
2007	Sycamore lots Sycamore Creek LN	No	Two vacant single-family properties in the Sycamore area floodplain acquired for open space
2007	Johnson/Wythes 515 S. Front St.	No	Multi-family zoned property (7.9 acres) along Issaquah Creek acquired for open space
2008	Corra Neighborhood Park	No	Underdeveloped SFR properties (2.4 acres) along E Fork Issaquah Creek acquired for future park development

The City continues to negotiate with property owners on potential future acquisitions, but offers are made only if funding is available.

Flood Conveyance Improvement Projects

The City of Issaquah has an aggressive program to improve the flood conveyance capacities of Issaquah Creek, East Fork Issaquah Creek, and Tibbetts Creek. In recent years this included replacement of seven bridges that were significant constrictions in the floodplain, several significant channel improvement projects that excavated overbank areas to increase conveyance capacity, sediment control projects to prevent sedimentation from reducing stream channel capacity, and stormwater system improvements. Table 3 summarizes the major projects.

Table 3. Constructed Flood Conveyance Improvement Projects in Issaquah

Year	Name	Location	Benefit/Status
1995	NW Sammamish Road Bridge Replacement	Issaquah Creek	Reduced flood hazards on arterial and adjacent commercial area

1997	Gilman Reach Channel Improvements	Issaquah Creek	Reduced flood hazards in Gilman area, including repetitive loss properties.
1997	Sunset Bridge Replacement	Issaquah Creek	Reduced flood hazards at Sunset Way
1997	NE Dogwood Bridge Replacement	East Fork Issaquah Creek	Reduced flood hazards on East Fork
1998	Pickering Reach Channel Improvements	Issaquah Creek	Reduced flood hazards in Pickering Place commercial area
1999	Newport Way Bridge Replacement	Issaquah Creek	Reduced flood hazards at road crossing and nearby residences
2000	Issaquah Creek Bank and Habitat Improvements	Issaquah Creek	Bank protection to stop channel migration towards school district building
2001	NW Sammamish Road Bridge Replacement	Tibbetts Creek	Replacement of inadequately sized culverts
2001	Newport Way Culvert Replacement	Tibbetts Creek	Replacement of inadequately sized culverts, which contribute to 12th Ave/Gilman flooding
2001	Tibbetts Creek Greenway – Maple Street to I-90	Tibbetts Creek	Restore creek and floodplain of Tibbetts Creek
2002	Bianco Mine Tailings Stabilization	Tibbetts Creek	Stabilize source of sediments that contributes to stream capacity problems in downstream reaches
2003	Tibbetts Creek Greenway Project at Tibbetts Manor	Tibbetts Creek	Channel restoration to contain flooding that impacts commercial areas on 12th Ave., Gilman Blvd, and west of SR-900.
2004	Rainier Bridge Replacement	East Fork Issaquah Creek	Replacement of deteriorating and constricting bridge.
2004	I-90 Tibbetts Creek Culvert Replacement	Tibbetts Creek at I-90	New bridge on I-90 to replace inadequately sized culverts to reduce flooding in commercial areas and improve fish passage.
2004	Tibbetts Creek Greenway Project at Lake Sammamish State Park	Tibbetts Creek downstream of I-90	Increase flood conveyance capacity of lower Tibbetts Creek channel to reduce flooding in commercial areas.
2004	Sycamore Area Flood and Habitat Improvements	Issaquah Creek	Construction of flood improvements: removal of old bridge abutment, low streamside levees, and constricting floodplain fill.
2004	Poplar Way Tibbetts Creek Culvert Replacement (Rowley Enterprises)	Tibbetts Creek	Replacement of inadequately sized culvert to reduce flooding in commercial area and improve fish passage.
2005	Juniper Bridge Replacement	Issaquah Creek	Replacement of old bridge with wider span, reducing 100-year flood elevations.
2007	Tributary 0170 Drainage Improvements	Tributary 0170 to Tibbetts Creek	Replaced undersized culverts with large box culverts, installed flood berms, and removed accumulated sediment from major City drainage course.

Future Flood Mitigation

The program for construction of channel improvements, bridge replacements, flood mitigation, and other flood improvement projects will continue in the future as outlined in the City of Issaquah 2010-2015 Capital Improvement Program. Table 4 summarizes the significant future projects.

As noted above, the City applied for a FEMA Hazard Mitigation Grant Program grant in September, 2009, for \$1.5 million in funds to elevate up to five single family homes and also floodproof the Gilman Square buildings. This grant, if awarded, funds 87.5% of the cost to mitigate flooding at these properties. The remaining 12.5% will be funded by the property owners.

Table 4. Future Flood Improvement and Mitigation Projects in Issaquah

Year	Name	Location	Benefit/Status
2009 on	Stormwater rehabilitation	Throughout City	Annual maintenance and upgrade program for stormwater conveyance improvements.
2009 on	Property acquisition and restoration	Throughout City	Funds for floodplain property purchases, repetitive loss properties, and demolition of frequently flooded structures.
2010	FEMA Hazard Mitigation Grant Program	Sycamore neighborhood; NW Cherry Place; Gilman Square	\$1.5 million grant application for elevating homes and floodproofing Gilman Square structures
2010 on	King County Flood Control Zone District	Throughout City	Bank stabilization on Issaquah Creek near Gilman Blvd (2010); channel improvements on E Fork Issaquah Creek (2012); floodplain property acquisition for permanent open space (future)
2010	Squak Valley Park Restoration	Issaquah Creek in Sycamore Neighborhood	Removal of streamside levee as part of stream restoration project will reduce flood elevations on adjacent single family residential properties.
unknown	NW Dogwood Bridge Replacement	Issaquah Creek at NW Dogwood Street	Replacement of constricting bridge that contributes to flooding in Cherry Place area. Funding depends on award of State bridge grant.
As needed	Floodplain mapping updates	Throughout City	Update flood insurance rate maps to reflect several flood mitigation projects and inaccurate flood hazard mapping

PLAN MAINTENANCE

The City of Issaquah's 2004 annex to the Regional Hazard Mitigation Plan indicated an annual review of the plan. Annual reviews of the 2004 plan did not occur due to limited staff availability, unfunded emergency management mandates (NIMS compliance, etc.) and other high priority planning and exercise efforts.

The 2009 update of the City of Issaquah's Hazard Mitigation Plan will be monitored annually by the Emergency Management Director and reviewed and evaluated following each declared disaster event by the City's Emergency Management Planning Group led by the Emergency Management Director. The Emergency Management Director is responsible for collecting and responding to public input regarding the plan received via e-mail through the City's web site.

The public will continue to be involved whenever the plan is updated and as appropriate during the monitoring and evaluation process. Prior to adoption of updates, the City will provide the opportunity for the public to comment on the updates. A public notice will be posted prior to the meeting to announce the comment period and meeting logistics.

According to the Disaster Mitigation Act of 2000 the Hazard Mitigation Plan must be formally updated every five years. The update process will begin in year four and include solicited opportunity for community input during the plan update process and prior to plan adoption. Changes will be coordinated with the King County Office of Emergency Management for inclusion in the updated Regional Hazard Mitigation Plan should the City choose to remain a partner in the regional plan.

Plan Implementation

Past mitigation strategies and action items have been incorporated into the City of Issaquah's Capital Improvement Plan and NFIP program. These items were then included in the City's annual budget and work plans and accomplished by the responsible departments. Mitigation initiatives included in this update will follow a similar process of annual review and incorporation into the City of Issaquah's Capital Improvement Plan, City Budget and Department work plans as appropriate and as determined by the City of Issaquah City Council.

The City of Issaquah has a strong record of recognizing and mitigating hazards. Through interdepartmental coordination and public involvement, hazards and associated risks are considered during updates of the Comprehensive Emergency Management Plan, the Land Use Plan, building code updates, Critical Areas Ordinance and other supporting codes and ordinances.

Plan Adoption

The 2004 City of Issaquah annex to the Regional Hazard Mitigation Plan was introduced to the City Council through Agenda Bill #5115 and Resolution 2004-10 was approved on December 6, 2004.

The 2009 City of Issaquah update to the Regional Hazard Mitigation Plan was introduced to the City Council through Agenda Bill #6004 and referred to the Services and Operations Committee. The Committee reviewed and forwarded the plan to the City Council where it was adopted on November 2, 2009 through resolution 2009-14.

APPENDIX A – RESOLUTIONS

2009 Resolution

DISTRIBUTION SCHEDULE City of Issaquah

Resolution No. 2009-14

AB 6004

Subject: A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ISSAQUAH, WASHINGTON, UPDATING THE CITY'S HAZARD MITIGATION PLAN AS A STAND ALONE DOCUMENT AND FOR USE AS AN ANNEX TO THE INTER-JURISDICTIONAL REGIONAL HAZARD MITIGATION PLAN FOR STATE AND FEDERAL ACCEPTANCE.

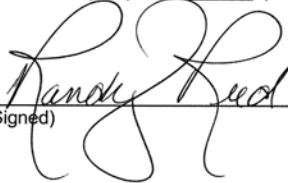
<u>11-02-09</u>	Date passed by City Council
<u>11-02-09</u>	Signed by Mayor
<u>11-02-09</u>	Signed by Council President
<u>11-02-09</u>	Signed by City Clerk

Copies of executed document distributed as follows:

<u> x </u>	Ordinance/Resolution file (original)
<u> x </u>	MRSC (per RCW 35A.39.010) - (electronic copy only)
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<u> x </u>	City Attorney (electronic copy only)
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<u> 1 </u>	Other: <u>N/A</u>
<u> </u>	Certified Copies: <u> </u>
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(Reviewed by City Clerk W) (Date 11/5)

(Signed)



(Date)

11-4-09

Updated 7/25/2006
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RESOLUTION NO. 2009-14

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ISSAQUAH, WASHINGTON, UPDATING THE CITY'S HAZARD MITIGATION PLAN AS A STAND ALONE DOCUMENT AND FOR USE AS AN ANNEX TO THE INTER-JURISDICTIONAL REGIONAL HAZARD MITIGATION PLAN FOR STATE AND FEDERAL ACCEPTANCE.

WHEREAS, the City of Issaquah has updated its exiting Hazard Mitigation Plan as required by Disaster Mitigation Act of 2000, and

WHEREAS, the City of Issaquah's Hazard Mitigation Plan 2009 Update is now designed as a stand alone document, and

WHEREAS, the City of Issaquah's Hazard Mitigation Plan 2009 Update will also be used as an annex to the King County Regional Hazard Mitigation Plan, and

WHEREAS, the City of Issaquah is required to adopt its Hazard Mitigation Plan 2009 Update prior to State and Federal review, and

WHEREAS, the Services and Operations Committed has reviewed the proposed plan and recommends adoption of the City of Issaquah's Hazard Mitigation Plan 2009 Update,
NOW THEREFORE,

THE CITY COUNCIL OF THE CITY OF ISSAQUAH, WASHINGTON,
HEREBY RESOLVES AS FOLLOWS:

Section 1. The City Council of the City of Issaquah hereby accepts and approves the City of Issaquah Hazard Mitigation Plan 2009 Update and authorizes the Administration to modify the plan as required by the Federal review process.

PASSED by the City Council this 2nd day of November, 2009.


MAUREEN MCCARRY, COUNCIL PRESIDENT

APPROVED by the Mayor this 2nd day of November, 2009.


AVA FRISINGER, MAYOR

ATTEST:


CHRISTINE L. EGGERS, CITY CLERK

APPROVED AS TO FORM:


OFFICE OF THE CITY ATTORNEY

2004 Resolution

0010.90000
VEO/gjz
11/16/04

RESOLUTION NO. 2004-10

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ISSAQUAH, WASHINGTON, ADOPTING THE INTER-JURISDICTIONAL REGIONAL HAZARD MITIGATION PLAN, AS APPROVED BY FEMA.

WHEREAS, the City of Issaquah and other jurisdictions within King County have expressed a cooperative interest in disaster mitigation planning efforts, and

WHEREAS, the City of Issaquah supports disaster mitigation efforts and regional disaster planning, and

WHEREAS, 35 public agencies including the City of Issaquah have annexes to the plan, and

WHEREAS, additional agencies are expected to join the plan as annexes, and

WHEREAS, regular revisions and updates are required by FEMA, and

WHEREAS, a locally adopted plan reviewed and approved by FEMA is required under the Mitigation Act of 2000, 44 CFR 201, NOW, THEREFORE,

THE CITY COUNCIL OF THE CITY OF ISSAQUAH, WASHINGTON,
HEREBY RESOLVES AS FOLLOWS:

Section 1. The City Council of the City of Issaquah hereby accepts and approves the City of Issaquah designated sections of the inter-jurisdictional Regional Hazard Mitigation Plan as approved by FEMA on October 2004.

{VEO586100.DOC;1/00010.900000/}

- 1 -

PASSED by the City Council this 6th day of December, 2004.

APPROVED:


NANCY DAVIDSON, COUNCIL
PRESIDENT

APPROVED by the Mayor this 6th day of December, 2004.

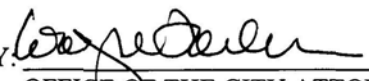

AVA FRISINGER, MAYOR

FILED this 7th day of December, 2004.

ATTEST:


CHRISTINE EGERS, CITY CLERK

APPROVED AS TO FORM:

BY: 
OFFICE OF THE CITY ATTORNEY

RESOLUTION NO. 2004-10
AGENDA BILL NO. 5115

DISTRIBUTION SCHEDULE

City of Issaquah

Resolution # 2004-10

Subject: A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ISSAQUAH, WASHINGTON, ADOPTING THE INTER-JURISDICTIONAL REGIONAL HAZARD MITIGATION PLAN, AS APPROVED BY FEMA.

<u>12-6-04</u>	Date passed by City Council
<u>12-6-04</u>	Signed by Mayor
<u>12-14-04</u>	Signed by Council President
<u>12-6-04</u>	Signed by City Clerk
<u> </u>	Date posted
<u> </u>	Date(s) published (normally by title only)
<u> </u>	Date effective

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<u> </u>	King County Library - Issaquah
<u>1</u>	Other - Bret Heath
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(Signed)

12-16-04
(Date)

Agenda Bill Number 5115 passed by Council on 12-6-04

Updated 11-6-03
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Distribution Schedule1.doc

APPENDIX B - HAZARD MITIGATION PLAN INITIATIVES

The mitigation initiatives listed in Appendix B were prepared by the City of Issaquah staff following the template and process used for the King County Regional Hazard Mitigation Plan.

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: City of Issaquah

Type of Hazard: Earthquake

Category: Critical Facility upgrade

Priority: Water #2

Plan Adoption #:

Brief Description of Project:
Mt Hood Pump Station seismic upgrade.

Rationale for project:

Seismic analysis shows the Mt Hood Pump Station as an earthquake vulnerable critical facility. The facility is located at the top of a slide area with the potential to impact downhill residence should the building fail and a supply line rupture.

RHMP Goals: Protect Life & Property

RHMP Objectives:

Lead Jurisdiction: City of Issaquah Public Works Director

Participating Jurisdictions: NA

Cost of Project: \$1,275,000

Estimated time period implemented: Within one year of funding project funding.

Funding Sources:	Matching % Primary	Matching % Secondary	Matching % Tertiary	Source/Date:
Water funds				
Grant funds				

Adoptive date and/or Ordinance #: t.b.d.

Status:
New project.

Benefit/Cost Ratio: 2.8:1

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: City of Issaquah

Type of Hazard: Flood

Category: Property Protection

Priority: Storm Water #7 Plan Adoption #:

Brief Description of Project:

Flood proof and raise repetitive flood loss properties in the City of Issaquah.

Rationale for project:

Certain properties within the City of Issaquah suffer repetitive flood losses. The aggregate cost of the repetitive losses is greater than the cost of mitigation.

RHMP Goals: Protect Property

RHMP Objectives:

Lead Jurisdiction: City of Issaquah Public Works Director

Participating Jurisdictions: NA

Cost of Project: \$605,000

Estimated time period implemented: Within two years of project funding.

Funding Sources:	Matching % Primary	Matching % Secondary	Matching % Tertiary	Source/Date:
Storm Water Fund				
Grant funds				

Adoptive date and/or Ordinance #: t.b.d.

Status:

New project.

Benefit/Cost Ratio: 3

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: City of Issaquah

Type of Hazard: Earthquake

Category: Critical Facility upgrade

Priority: Water #1

Plan Adoption #:

Brief Description of Project:

Retrofit water system facilities with seismic restraints to prevent failure during seismic events.

Rationale for project:

The Issaquah water system contains several older facilities that seismic studies indicate may fail during an event. Retrofits will mitigate known weaknesses to prevent total failure.

RHMP Goals: Protect Life & Property

RHMP Objectives:

Lead Jurisdiction: City of Issaquah Public Works Director

Participating Jurisdictions: NA

Cost of Project: \$250,000

Estimated time period implemented: Within one year of funding project funding.

Funding Sources:	Matching % Primary	Matching % Secondary	Matching % Tertiary	Source/Date:
Water funds				
Grant funds				

Adoptive date and/or Ordinance #: t.b.d.

Status:

Carryover project

Benefit/Cost Ratio: 9.2:1

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: City of Issaquah

Type of Hazard: Flood

Category: Protective Measures

Priority: Storm Water #1

Plan Adoption #:

Brief Description of Project:
Install flood gage on Issaquah Creek at Fifteen Mile Creek.

Rationale for project:
The current upstream flood warning gauge on Issaquah Creek does not capture the Fifteen Mile Creek drainage basin. Other flood gauges within the City do not provide adequate warning to implement protective measures. The proposed gauge will capture the Fifteen Mile drainage basin and provide an approximate two hour warning.

RHMP Goals: Protect Life & Property

RHMP Objectives:

Lead Jurisdiction: City of Issaquah Public Works Director

Participating Jurisdictions: NA

Cost of Project: \$33,000

Estimated time period implemented: Within one year of funding project funding.

Funding Sources:	Matching % Primary	Matching % Secondary	Matching % Tertiary	Source/Date:
Storm Water Fund				
Grant funds				

Adoptive date and/or Ordinance #: t.b.d.

Status:
New project.

Benefit/Cost Ratio: 69.7:1

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: City of Issaquah

Type of Hazard: All

Category: Public Education

Priority: General #1

Plan Adoption #:

Brief Description of Project:

Work with Issaquah Citizen Corps and other private and non-profit organizations to promote CERT and Map Your Neighborhood (MYN) programs throughout the City of Issaquah.

Rationale for project:

During an emergency or disaster event City of Issaquah resources will be quickly overwhelmed. Citizens prepared for disasters require less resources to care for and may also be partners in the response and recovery efforts.

RHMP Goals: Protect Life & Property
Support Emergency Services
Public Education

RHMP Objectives:

Lead Jurisdiction: City of Issaquah Emergency Management Director

Participating Jurisdictions: NA

Cost of Project: \$50,000

Estimated time period implemented: Within one year of project funding.

Funding Sources:	Matching % Primary	Matching % Secondary	Matching % Tertiary	Source/Date:
General fund				
Grant funds				

Adoptive date and/or Ordinance #: t.b.d.

Status:

New project.

Benefit/Cost Ratio: 46:1

APPENDIX C – PUBLIC MEETING RECORDS



- [HOMEPAGE](#)

- [\[Redacted\]](#)

- [MAYOR & COUNCIL](#)

[\[sitemap\]](#) [\[advanced search\]](#)

Today is:
August 13, 2009

DAY		WEEK		MONTH		
Aug 2009						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					



Issaquah, WA
Thu Aug 13 2009



[98027 Conditions and Forecast](#)

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Public Meeting: Hazard Mitigation Plan

Event Date(s): Thursday, August 13, 2009

Department: Public Works Operations

Event Type: Public Meeting

Details: The City of Issaquah is updating its Hazard Mitigation Plan, and invites your comments on projects to include in the plan.

The federal Disaster Mitigation Act of 2000 requires all jurisdictions applying for federal hazard mitigation grant monies to have a hazard mitigation plan.

To view Issaquah's draft update and proposed project list, click [here](#). Questions regarding the plan can be directed to Bret Heath at (425) 837-3470. Written comments will be accepted via mail (P.O. Box 1307, Issaquah WA, 98027-1307) or [e-mail](#) until 5 p.m. Aug. 17, 2009.

Starts: 7:00 PM

Location: City Hall - Eagle Room
130 E. Sunset Way
Issaquah, Wa 98027

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<http://www.ci.issaquah.wa.us/Calendar.asp?View=EVENT&EventID=1159&Date=8/13/2009&SectionID...> 8/13/2009

Hazard Mitigation Plan

Overview

Why have a hazard mitigation plan

- Required by federal Disaster Mitigation Act of 2000 (DMA2000)
- Pre-requisite to obtaining hazard mitigation funds
- Updates required every five years

Regional Hazard Mitigation Plan

- Allowed under DMA2000
- King County lead agency
- Issaquah is a participating agency

Plan Components

- Community Profile
- Hazards
- Goals and Objectives
- Funding Sources
- Strategy Implementation
- Mitigation Strategy
- National Flood Insurance Program
- Anticipated Benefits
- Mitigation Strategy Update (project status)
- Plan Administration

Potential Projects

- Proposed projects from Capital Improvement Plan
- Other Proposals

Benefit Cost Review

- Review required on all proposed projects
- Only those having BCA ≥ 1 included in plan
- Funding candidate projects required to have detailed benefit cost analysis

Next Steps

- Benefit cost review of proposed projects
- Submit plan to King County
- King County assembles local plans and submits to State EMD
- State EMD reviews for compliance with requirements
- FEMA reviews for compliance and approves plan
- City Council considers plan adoption (late 2009)

Council Services & Operations Committee - Agenda
Thursday, October 15, 2009

Council Services and Operations Committee Meeting
October 15, 2009 @ 5:00 PM
City Hall / Police Facility
130 E Sunset Way
Issaquah, WA. 98027

Committee Members:
Eileen Barber, Chair
John Rittenhouse
Joshua Schaer

Staff Liason:
Paul Ayers, Chief of Police

Revised Agenda

- 5:00 A AB 6033 Regional Fire Authority Planning Resolution**
Staff: Wes Collins, Deputy Fire Chief
- 5:15 A AB 6004 Hazard Mitigation Plan**
Staff: Brett Heath, Director of Public Works Operations
- 5:30 A AB 6015 Winter Storms Expenditure Adjustments**
Staff: Brett Heath, Director of Public Works Operations
- 5:45 A AB 5959 Agreement with Family Resource Center of Redmond**
John Rittenhouse, Councilmember
- 6:00 I Financial Update to Committee**
Staff: Jim Blake, Finance Director

Revision: Item Tabled: AB 6018 Tourism Promotion Agreement with City of Snoqualmie
Staff: Dan Trimble, Economic Development Manager

Next Committee Meeting: November 19, 2009 at 5:00 PM

(I) Informational/Update (A) Action

(D) Discussion

<http://www.ci.issaquah.wa.us/Agendas.asp?AMID=2218&Print=True>

10/15/2009

**Back to Public Works
Operations**

**Directions to PWO
Backflow Tester List
2009 Maintenance
Overlay Project
Water Quality
Reports
Hazard Mitigation
Plan**

**Bids/RFPs
Calendar Events
City News
Staff Directory
Web Links**

P.O. Box 1307
City Shop
670 1st Avenue NE
Issaquah, WA 98027
Phone: 425-837-3470
Fax: 425-837-3479
Email: WebMail-
PWO@ci...
Hours: 7:30 AM TO 4:00
PM

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CALENDAR OF: MEETINGS & EVENTS

Today is:
October 19, 2009

DAY	WEEK	MONTH
Oct 2009		
S	M	T W T F S
		1 2 3
4	5	6 7 8 9 10
11	12	13 14 15 16 17
18	19	20 21 22 23 24
25	26	27 28 29 30 31



[/ Public Works Operations / Hazard Mitigation Plan](#)

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City of Issaquah Hazard Mitigation Plan

The City of Issaquah is updating its Hazard Mitigation Plan, and invites your comments on projects to include in the plan.

The federal Disaster Mitigation Act of 2000 requires all jurisdictions applying for federal hazard mitigation grant monies to have a hazard mitigation plan.

To view the current draft of Issaquah's Hazard Mitigation Plan and addendum to the King County Hazard Mitigation Plan along with other documents, see below. Questions regarding the plan can be directed to Bret Heath at (425) 837-3470. Written comments will be accepted via mail (P.O. Box 1307, Issaquah WA, 98027-1307) or **e-mail**.



ISSAQUAH_HMP_2009_DRAFT6.PDF (4227.9KB)

Draft - Issaquah Hazard Mitigation and Addendum to the King County Regional Hazard Mitigation Plan

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ENDNOTES

1. Statistics and information regarding Issaquah, Washington received from the City of Issaquah, Washington Website, www.ci.issaquah.wa.us, 2007
2. "Scenario for a Magnitude 6.7 Earthquake on the Seattle Fault", Earthquake Engineering Research Institute and the Washington Military Department, Emergency Management Division, June 2005
3. "Liquefaction Susceptibility of the Greater Eastside Area, King County, Washington", Washington State Department of Natural Resources, August 2002
4. Seiche, "Washington State Earthquake Hazards", by Linda Noson, Anthony Q amar, and Gerald Thorsen
5. Information on flooding in Issaquah, Washington is summarized from public documents found on the City of Issaquah Website, www.ci.issaquah.wa.us, 2007
6. January 2004 Camp Creek Landslide, King County Hazard Mitigation Plan: HIVA, Updated 2005, King County, Washington
7. Severe Storm, Washington State HIVA, Olympia, Washington, April 2001
8. Proposed City of Issaquah, Washington 2008 Budget, City of Issaquah, Washington, 2007
9. Volcano, Washington State HIVA, Olympia, Washington, April 2001
10. A Progress Report on The National Fire Plan in Washington State, Washington State Department of Natural Resources, and other participating public agencies, Olympia, Washington, 2003
11. A Progress Report on The National Fire Plan in Washington State, Washington State Department of Natural Resources, Olympia, Washington, and other participating public agencies, 2003
12. Abandoned Underground Mine, Washington State HIVA, Olympia, Washington, April 2001
13. King County Department of Public Health, King County, Washington www.metrokc.gov/health/prevcont/pandemic-flu, 2007
14. United States Department of Health, Washington, D.C. www.pandemicflu.gov, 2007
15. Hazardous Materials, King County Hazard Mitigation Plan: HIVA, Updated 2005, King County, Washington
16. Spill Contingency Management Plan (SCMP), City of Issaquah, King County, Washington, February 2005
17. Spill/Incident Response Plan for the Lower Issaquah Valley, the Sammamish Plateau, and the Cascade View Zones, Appendix S to the State of Washington Wellhead Protection Program, 2005
18. City of Issaquah, Washington, Agendas and Minutes, City Council Meeting, City Website, www.ci.issaquah.wa.us, January 5, 2004
19. Pipeline, Washington Military Department Emergency Management Division, www.emd.wa.gov/hazards_pipeline, Date unknown
20. Information received from emergency management meeting on October 17, 2007, with Captain Steve Westlake, Eastside Fire, Issaquah, Washington
21. Information received from emergency management meeting on October 17, 2007, with Captain Steve Westlake, Eastside Fire, Issaquah, Washington
22. Power Grid Failure, Josh Bickford and Jason McDonald, December 9, 2006 courses.ece.uiuc.edu/ece317/presentations

23. *Federal Bureau of Investigation*, terrorism definition, www.fbi.gov
24. *Cyberterrorism*, King County Hazard Mitigation Plan: HIVA, Updated 2005, King County, Washington
25. *Cyberterrorism*, King County Hazard Mitigation Plan: HIVA, Updated 2005, King County, Washington
26. *I-90 Bellevue to North Bend Corridor Study*, Washington State Department of Transportation, Olympia, Washington, August 2007
27. *I-90 Bellevue to North Bend Corridor Study*, Washington State Department of Transportation, Olympia, Washington, August 2007
28. *I-90 Bellevue to North Bend Corridor Study*, Washington State Department of Transportation, Olympia, Washington, August 2007
29. *Transportation Program*, City of Issaquah, Washington City Website, 2007 www.ci.issaquah.wa.us
30. *Fire Hazards*, King County Hazard Mitigation Plan: HIVA, Updated 2005, King County, Washington
31. *City of Issaquah Flooding Repetitive Loss and Flood Mitigation Plan Annual Progress Report - 2009*